MODEM™
MGR

INSTRUCTION MANUAL

Serial No. _694_

Printed in U.S.A.

TRADEMARK	REGISTERED BY
AIO	Transend Corp.
Alphabits	Street Electronics Corp.
Apple, Apple][+, Apple //e, Apple //c, Applesoft	Apple Computer, Inc.
Apple Clock	Mountain Computer, Inc.
Apple Super Serial Card	Apple Computer, Inc.
Apple-Cat	Novation, Inc.
ASIO	Transend Corp.
AUTO-CAT	Novation, Inc.
Centronics	Centronics Data Computer Corp.
CompuServe Information Service	CompuServe, Inc.
Courier 2400	U.S. Robotics, Inc.
CPS MultiFunction Card	Mountain Computer, Inc.
Dasher D200	Data General Corp.
DEC VT52	Digital Equipment Corp.
Delphi	General Videotex Corp.
Dumpling GX	Microtek, Inc.
Epson	Shinshu Seiko Co.
GraphiCard	Practical Peripherals, Inc.
Grappler	Orange Micro, Inc.
J-CAT	Novation, Inc.
Keyboard & Display Enhancer	Videx, Inc.
Microbuffer II	Practical Peripherals, Inc.
Micromodem	Hayes Microcomputer Products, Inc.
MODEM MGR	James H. Okubo
ModemCard	Transend Corp.
Multi I/O	AST Research, Inc.
Multicore	Quadram
Networker	Zoom Telephonics, Inc.
PKASO/U	Interactive Structures, Inc.
PROCLOCK	Practical Peripherals, Inc.
ProDOS	Apple Computer, Inc.
ProModem	Prometheus Products, Inc.
PSIO	Videx, Inc.
SeriALL	Practical Peripherals, Inc.
SMART-CAT	Novation, Inc.
Smartmodem	Hayes Microcomputer Products, Inc.
Super Serial Imager	Apricorn
Telenet	GTE Telenet Communications Corp.
The Source	Source Telecomputing Corp.
Thunderclock Plus	Thunderware, Inc.
Timemaster II H.O.	Applied Engineering
Tymnet	Tymshare Co.
UniPrint	Videx, Inc.
Ultraterm	Videx, Inc.
Versacard	Prometheus Products, Inc.
Videoterm	Videx, Inc.
Viewmaster 80	Applied Engineering
Viewmax-80	Micromax Computer Intelligence, Inc.
Wizard-IPI	Wesper Microsystems, Inc.
Wizard-80	Wesper Microsystems, Inc.
ZOOM/MODEM IIe	Zoom Telephonics, Inc.

APPLE PERSONAL MODEM

MODEM MGR also supports the new Apple Personal Modem. Add "Apple Personal Modem" to the lists on pages 1-6 and 10-1.

This is a "smart" modem which provides the usual "smart" features. This modem uses an unusual eight-pin connector instead of a DB-25 connector. When this modem is used with an Apple Part No. 590-0331 (][+ or //e) cable or Apple Part No. 590-0333 (//c) cable, the pin assignments are listed below.

DB-25 Connector 590-0331	DIN Connector 590-0333	Function
7	3	Signal common (ground)
3	4	Modem signal output
2	2	Modem signal input
6,8	5	DSR modem output
20	1	DTR modem input

Although the modem has a carrier-detect (DCD) output, neither cable handles it. You cannot use carrier control with these cables.

The modem DSR output is always "high" when the modem is powered on.

STREET ELECTRONICS BUSINESSCARD

This is multi-function card with two Type 6551 serial channels and a clock function. The card must be placed in slot 1. When you run the INSTALL program, specify slot 1 for the printer and clock functions, and slot 2 for the serial communications function.

Set the card switches to the desired default baud rate and communications parameters. When MODEM MGR is run, it will read the settings of these switches and set the communications defaults accordingly. However, if you have used the INSTALL program to specify a non-zero value for the communications command byte, the values you have specified for the communications command and control bytes will override the default values.

The clock time-of-day display will not show AM or PM. For additional information on the printer and communications features of this card, refer to the description of the Street Electronics Alphabits card.

CERMETEK APPLE-MATE MODEM

MODEM MGR also supports the Cermetek AppleMate modem. This is a "smart" modem which provides the usual "smart" features. It supports 110, 300, or 1200 baud and provides pulse or tone dialing. This modem uses a Type 6551 device. There are several configuration switches on the card. SW4 must be closed and SW5 must be open. If you are using carrier control, SW10 must be set open before you power your computer on. If you are not using carrier control, set SW10 closed.

PACKET RADIO TNC

If you are using a packet radio TNC, select the "Non-smart modem" when you use the INSTALL program.

MACRO STRING LENGTH

The length of the macro string discussed on page 8-3 must be no longer than 32 characters with the DOS 3.3 version and no longer than 64 characters with the ProDOS version. If you want to specify a longer string, break the string into shorter segments and use each segment in successive commands. For example with the S macro command:

S"I am using an Apple //e with flo":S"ppy disk drives"

WARNING FOR FAST TYPISTS

If you are a fast typist and you depend on the keyboard rollover feature, you will sometimes have as many as three keyboard keys depressed simultaneously. In some cases, this will generate four characters instead of three. This is a characteristic of the keyboard. For example, if you rapidly type the U, the I, and the space bar in any order on a //e or //c keyboard without releasing each key, you will also generate a control-K character. This is the same as the "up arrow" key. If you are using the MODEM MGR editor, you will see the U, I, and space on the screen; you will also see the cursor jump up one line. There are other key combinations which will generate an extra control character that can cause confusing results.

SINGLE-WIRE SHIFT MOD

If you have specified the single-wire shift mod in the INSTALL program, there will be two keyboard modes which you can toggle with Control-A. One mode is the case-lock mode which provides the standard upper-case][+ keyboard. The other mode provides upper/lower case shifting with the shift key. You may specify another key instead of Control-A when you run the INSTALL program.

^Q AND ^S IN BLOCK MODE

If you type a Control-Q or Control-S character into the text in the block mode, everything up to and including the ^Q or ^S character will be sent, but the remainder of the block and CR will not be sent. This will avoid the lock-up if the modem or communications device echoes the Control-S and will also allow you to send a Control-Q or Control-S without a CR appended. If you wish to send these control characters in the block mode with additional text following, set XON and XOFF to $00 in the INSTALL program.

CABLE PROBLEM (][+ OR //E)

If you are using the Apple Part No. 590-0121 cable from the Apple
Modem 300 or 1200 accessory kit, you may have some problems if you
try to use carrier control. This cable connects the modem DCD signal
to both pins 5 and 8 at the DB-25 connector. Some serial cards use
one of these pins for the transmitter control input. If your modem is
set for carrier control, the transmitter control will be set "low" when
you are not on-line and you will not be able to transmit commands to
the modem. If you set your modem for a continuous "high" carrier
output, you can send commands to the modem but you cannot use
carrier control. If you wish to use carrier control, you must use a
special cable or modify the card or its output cable. For example, on
an Apple Super Serial Card, the transmitter control is on pin 5. You
can disconnect the wire on pin 5 of the short cable that goes from the
card to the rear of the computer.

OTHER PROBLEMS

Do you have any of the following problems?
1) Disk boots ok for a while but later does not boot reliably.
2) Disk boot halts with "UNABLE TO LOAD PRODOS" message.
3) ProDOS catalog is trashed.
4) Early ProDOS files have been over-written by later files.
Try the following:
a) Remove the disk before turning the computer on or off.
b) Remove the disk if you use Open-Apple/Control/Reset followed by
   Control/Reset to escape from a program.
c) If you always boot a disk by inserting the disk and latching the
   drive door after the drive is running and the head is homed, you
   may cause excessive cumulative head loading stress on track zero.

If you have any of the following problems:
1) Program bombs into monitor (* displayed).
2) Error message "INSERT SYSTEM DISK AND RESTART -ERR 01".
3) Program hangs until Control/Reset is typed.
You may have one of the following conditions:
a) Intermittent seating of computer or card IC in socket.
b) Power supply overload (too many power-hog cards).
c) Modem passes transient voltage spike to computer during pulse
   dialing, hangup, or raising of hook switch.
d) Common-mode voltage spike from telephone lines is passed through
   modem to computer.
e) Computer, modem, and/or telephone circuits are not properly
   grounded.
f) Voltage spike from heavy machinery, radio transmitter, etc.

S U P P O R T

Support for this program is limited to the following:

1) Unlimited telephone support up to two months after purchase of program.

2) After two months, one support call per month only.

You must supply the purchaser's name and software serial number when you request support.

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ERRATA

Please make the following corrections to your instruction manual:

Pg 1-9, para 1, change "ctalog" to "catalog".

Pg 4-10, para 4, change "If you want to use carrier control, connect the modem carrier-detect signal to pin 8. If you don't want to use carrier control, disconnect the signal to this pin or connect pin 8 to a continuously 'high' signal" to "If you want to use carrier control, set switch SW1-7 to ON and connect the modem carrier-detect signal to pin 8. If you don't want to use carrier control, set switch SW1-7 to OFF".

Pg 4-15, para 4, change "You can use the J terminal command" to "You can use the M terminal command".

Pg 4-19, 4-20, delete last line on page 4-19 and top paragraph on page 4-20.

Pg 4-22, last para, change "you must use the J terminal mode command" to "you must use the M terminal mode command".

Pg 5-9, para 2, change "serial/comm card video driver" to "serial/comm card driver".

Pg 6-17, para 4, delete "or you can create an emulation file to do this".

Pg 7-19, change "Y ^_ $1D" to "Y ^_ $1F".

Pg 9-9, para 5, change "load it into the text buffer and write it back to disk" to "load it into the text buffer, delete at least one character, and write it back to disk".

Pg 11-1, para 3, change "With non-smart modems" to "With external non-smart modems".

Pg 11-6, change "Apricorn Super Serial Imager - pin 8" to "Apricorn Super Serial Imager (Switch SW1-7 ON) - pin 8".

NOTE: The Micromax Viewmax-80 will not work in the split-screen mode with some Apple][+ computers.

4/7/86

T A B L E   O F   C O N T E N T S

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I N T R O D U C T I O N

MODEM MGR is a communications program for the Apple][+, //e,
and //c personal computers. It supports receiving and transmitting
of text or data between your computer and other systems over phone
lines with a modem or with a direct-wired connection.

MODEM MGR is a menu- and command-oriented communications
software package. It provides you total communications control
with only a few command keystrokes. MODEM MGR incorporates
built-in control compatability with most "smart" modems and han-
dles all applicable hardware baud rates up to 19200 baud including
110, 135, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200, 9600,
and 19200 baud. MODEM MGR provides easy user access to modem
features such as dial, answer, hangup, baud rate changes, and com-
munication parameter changes.

FEATURES

MODEM MGR provides the following features:

1) Operating system - MODEM MGR will run on the DOS 3.3 or
ProDOS operating systems. Both systems are supported in this soft-
ware package.

2) Peripheral card support - MODEM MGR supports most of the
popular peripheral cards and modems used with the Apple computer
(see list).

3) Text capture - MODEM MGR has a capture buffer to allow you
to save all received text. You can review the contents of the buffer
on the video screen, send it to a printer, write it to a disk file, trans-
mit it to another system, or edit it.

4) Fast speed - MODEM MGR was designed to support all applicable
baud rates from 110 baud to 19200 baud. It uses customized fast vid-
eo routines to avoid loss of received characters at high baud rates.
With some video cards, MODEM MGR can receive and display ordi-

nary text at baud rates up to and including 19200 baud continuously
without losing any received characters.

5) Split-screen option - In addition to the normal full-screen video
display, MODEM MGR also supports a split-screen display option.
With the split-screen option, received text is displayed in the upper
part of your screen while your typed transmitted text is displayed
in the lower part. Both portions will scroll independently. When
you use the split-screen display, you can also use a keyboard block
mode option. This option allows you to store your typed text in a
memory block before it is sent. With the block mode enabled, you
can type the next block of text you want to transmit in the lower
screen while you are receiving text in the upper screen.

6) Full-screen text editor - MODEM MGR provides a full-screen
text editor with many of the editing features of a word processor.
You may edit captured text or text from a disk file and save the
edited text to disk or re-transmit it. You may use the editor even
while you are online.

7) Macro script files - MODEM MGR lets you create and execute
macro script files to automatically perform most of the functions
of this program in a programmed sequence. You can prepare a
single macro file to dial, send a password, log-in, request infor-
mation, capture text, save to disk, and hangup without requiring
any attention on your part. You may chain macro files to obtain
an unlimited number of macro commands in a sequence.

8) Function keys - MODEM MGR allows you to program up to nine
"function" keys which you can use to send special characters, send
frequently-used text strings, or execute complete macro command
sequences.

9) Text transmission - You can transmit text from a disk file or
the capture buffer to another system with the following throttle
options: character pacing, line pacing, echo pacing, XON/XOFF
pacing, prompt-string pacing, or no pacing.

10) File transfer - You can transfer any type of DOS 3.3 or ProDOS
file including random-access files with a special MODEM MGR error
detection and correction protocol. The XMODEM protocol is also

supported.

11) Clock support - If you have one of the clock cards listed, MODEM MGR will allow the continuous display of time-of-day or elapsed time in the upper-right corner of the screen. You can time your phone calls or you can program macro commands to start execution at a specific time.

12) Multiple video formats - MODEM MGR supports several video formats depending on the video device you are using. This includes 40 columns by 24 rows, 80 columns by 24 rows, and all eight video formats provided by the Videx Ultraterm video card. You can switch between Ultraterm formats while online and you can use any Ultraterm format in the terminal and editor modes.

13) Dialing - If your modem supports dialing, you can dial commonly-used phone numbers with a few keystrokes from a phone number list, a macro file, or by pressing a pre-programmed function key. You can also re-dial the last number dialed or dial a default number with just a few keystrokes.

14) Unattended operation - MODEM MGR provides unattended answer operation with password protection so your system can act as a host to let others call and leave messages or exchange files with your system.

15) Terminal emulation - MODEM MGR provides emulation of some popular terminals including the DEC VT-52 and the Data General D200. Several emulation files are provided and a program is included to generate your own special emulation files.

16) Printer support - MODEM MGR provides a printer buffer and lets you print while online or print from the capture buffer or a disk file.

17) Screen snapshot - MODEM MGR allows you to save a copy of the present screen display in the capture buffer. This lets you save a disk catalog, status messages, or a time-stamped screen.

18) Help files - You can display help files which summarize operational commands.

19) Flexibility - The use of customized drivers provides you with maximum flexibility. You can tailor MODEM MGR to utilize the special features of your hardware. The use of individual drivers will also allow you to incorporate easy updates to support future communications devices. The installation program lets you configure most of the program defaults to your preferences.

20) There are many additional features provided by MODEM MGR like support of lower-case devices, XON/XOFF flow control, automatic saving of a full buffer, scroll speed control while viewing buffer text, display of control characters, sending characters not available on a][+ keyboard, choice of carrier control, provision for text formatting, Apple-CAT II 202 semi-break-in keying, efficient transfer of random-access files and efficient transfer of DOS 3.3 files having unused sectors.

SYSTEM REQUIREMENTS

MODEM MGR will run on an Apple][+, //c,][e, or enhanced //e computer. The enclosed program disks are 5-1/4 inch floppy disks so you are required to have at least one 5-1/4 inch disk drive. The ProDOS version can be transferred to any ProDOS-compatible disk drive (3-1/2 inch, RAM, hard disk, etc). Although this program may run on other "compatible" computers, operation on computers other than those listed here is not guaranteed. Some of the devices listed will work on some computer models only.

MODEM MGR will support only the following video devices.

Apple built-in 40-column
Apple 80-column card in auxiliary slot of][e or //e
Apple //c built-in 80-column
Apple][+,][e, or //e with one of the following video cards
  installed in an expansion slot:
    Applied Engineering Viewmaster-80
    Micromax Viewmax-80
    Videx Ultraterm
    Videx Videoterm
    Wesper Wizard-80

Some "compatible" 80-column cards may work in the auxiliary slot

of the][e or //e. MODEM MGR will support only the five 80-column cards listed above in the expansion slot.

MODEM MGR supports the following serial cards or multi-function cards with a serial function for use either as a communications interface card or a serial printer card.

Apple Communications Interface
Apple II Super Serial
Apricorn Serial Interface
Apricorn Super Serial Imager
AST Multi I/O
Calif. Computer Systems 7710 Serial Interface
Calif. Computer Systems 7711 Super Serial Interface
Mountain Hardware CPS MultiFunction
Orange Micro Serial Grappler (printer only)
Practical Peripherals SeriALL
Prometheus Versacard
Quadram Multicore
SSM or Transend AIO Interface
SSM or Transend ASIO Interface
Street Electronics Alphabits
Videx PSIO Dual Function Interface

MODEM MGR will support the following internal plug-in modems:

Hayes Micromodem II and IIe
Novation Apple-CAT II
Novation Apple-CAT II with 212 Upgrade Card
Prometheus Promodem 1200A
Transend ModemCard
Zoom Modem][e
Zoom Networker

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MODEM MGR will support the following external modems and
communications peripherals:

Apple Modem 300 and 1200
Hayes Smartmodem 300, 1200, and 2400
Most "Smartmodem-compatible" modems (Anchor Signalman Mark
  XII, US Robotics Auto Dial 212A, etc)
Novation SMART-CAT
Prometheus Promodem 1200
US Robotics Courier 2400
Most Auto modems (Novation Auto-CAT, VADIC 3451, etc)
Most Dumb modems (Acoustic, etc)
Kantronics Universal Terminal Unit
TAPR Packet Radio Terminal Mode Controller 1 and 2
Many other units with RS-232 interfaces

The following clock cards or multi-function cards with a clock
function are the only clock devices supported by this program.
Other clock cards or earlier versions are not supported.

Applied Engineering Timemaster II H.O.
AST Multi I/O
Calif. Computer Systems 7424 Calendar/Clock
Mountain Hardware CPS MultiFunction
Practical Peripherals Proclock
Prometheus Versacard
Quadram Multicore
Quadram ProDOS Clock/Calendar
Thunderware Proclock
Thunderware Thunderclock Plus

The following parallel cards or multi-function cards with a parallel
printer function are supported for use as a parallel printer card.
Many other parallel printer cards not listed here are also supported.

Apple II Parallel Interface
Apple Parallel Printer Interface
Calif. Computer Systems 7728
Calif. Computer Systems 7731
Epson Apple II Parallel Interface

Chapter 1. Introduction

Interactive Structures PKASO/U
Microtek Dumpling GX
Microtek RV-611C
Mountain Hardware CPS MultiFunction
Orange Micro Grappler+
Practical Peripherals GraphiCard
Practical Peripherals Microbuffer II
Prometheus Versacard
Quadram Multicore
SSM or Transend AIO Interface
Videx PSIO Dual Function Interface
Videx UniPrint
Wesper Wizard Intelligent Printer Interface

DISK PROGRAMS

You may run MODEM MGR with either the DOS 3.3 or ProDOS
operating system. Use the system you are most familiar with. A
separate disk is furnished for each operating system. Use the
disk provided for the operating system you prefer. Label your
disks so you won't use a disk with the wrong operating system.

With the DOS 3.3 version, you can only use 5-1/4 inch floppy disk
drives. With ProDOS, you can use any disk drive which is compa-
tible with ProDOS, including RAM drives.

You may transfer one or all program files on the ProDOS disk to
another disk using a file transfer program like the ProDOS FILER.
However, the following programs on the DOS 3.3 disk should never
be transferred:

  MDM1
  MDM2
  MDM3
  MDM4

Do not use a file transfer program (like FID) to move any of these
four DOS 3.3 files. The only way to place these four files on a
disk is to copy the original DOS 3.3 work disk using a disk copy
program like the COPYA program. Any other DOS 3.3 file can be
transferred individually using the FID program.

COMMON TERMS

The following is a list of definitions of some of the terms used
in this program and manual. The letter X is used in some of the
examples to represent any letter which may apply.

CR	Carriage return character.
LF	Line feed character.
Filename	DOS 3.3 file name.
Pathname	Full or partial ProDOS file pathname.
^X	Control-X character.
[RETURN]	Type the RETURN key.
[ESC]	Type the ESC key.
[SPACE]	Type the space key.
[CTRL] X	Press the Control key while you type the X key.
Control-X	Refers to the [CTRL] X entry.
S#	Disk slot number (e.g. S6).
D#	Disk drive number (e.g. D1).
O	Letter O
0	Number 0
Wait..	Wait (until the cursor appears on the next line)

FILENAMES AND PATHNAMES

When disk files are read or written, you will have to furnish a
filename (DOS 3.3) or pathname (ProDOS). You will see one of
the following prompts displayed:

    Filename? -->
    Pathname? -->

Enter the desired name followed by [RETURN]. In most cases
(except emulation files), you may add a comma followed by S#
and/or D# to specify a slot and/or drive number. For example:

MYFILE,S6,D2

specifies slot 6 and drive 2. You may use the backspace key to
correct any typing mistakes before you type the [RETURN] key.
If you enter lower case letters, they will be converted to upper
case. If you enter a question mark (?) followed by [RETURN],

a disk ctalog will be displayed. After the catalog is displayed, the filename or pathname request will be repeated.

You may enter no more than the following maximum number of characters:

DOS 3.3 filename: 30 characters
ProDOS pathname: 64 characters

This maximum includes the comma, S#, and D# characters, if used. When you have entered the maximum allowed, no more characters will be accepted from the keyboard.

CHAPTER 2

STARTUP

The MODEM MGR software consists of three 5-1/4 inch floppy
disks. Programs are written on both sides of these disks for a total
of six sides. One disk is the DOS 3.3 version which has the work
program on one side and the install program on the other side. The
second disk is the ProDOS version which also has the work program
on one side and the install program on the other side. The third
disk is the utility disk which contains several emulation files and
the program which generates these files. One side of the utility
disk is the ProDOS version and the other side is the DOS 3.3 ver-
sion. The ProDOS side of the utility disk also has the serial printer
drivers used by the ProDOS install program.

If you intend to use only one operating system exclusively (DOS 3.3
or ProDOS), you need only three of the six disk sides. Two of these
three sides are used to initially install and configure the program.
After installation, you will use only one disk side.

BACKUP DISKS

Before doing anything else, you should make a backup copy of both
sides of the disks. Store the originals in a safe place and use the
copies instead. The disks are not copy protected so the use of a bit
copier is not necessary and not recommended. The DOS 3.3 COPYA
program or the ProDOS FILER program is recommended. Be sure
to label the disks according to operating system (DOS 3.3 or ProDOS)
and type (work, install or utility disk). Place a write-protect sticker
on the install disks, but not on the work disks.

QUICK STARTUP

You will obtain maximum usefulness out of this program if you read
the manual completely before attempting to run the program. How-
ever, if you wish to start using the program as soon as possible, this
chapter will provide the essentials needed to get started. If you have
already installed a video card and modem in your system and they
are working properly, you may be able to start using this program

without much effort.

However, if you have not cabled some of your communications de-
vices to your computer or you are not sure everything is functioning
properly, you should skip this chapter and start at Chapter 3 instead.
Chapter 3 and subsequent chapters provide more complete and de-
tailed information on installing the hardware and configuring the
software.

We have written the brief instructions in this chapter for the user
who has had some experience with an installation or configuration
program and does not require a step-by-step explanation all the way
through. If you find these instructions are too skimpy to follow,
skip this chapter and start at Chapter 3.

We recommend you eventually read the entire manual so you will be
aware of all of the capabilities this program provides. MODEM MGR
has many unusual features and some of them are mentioned only once
in this manual. If you don't read the entire manual, you may miss
a feature which can be helpful to you. Several different sections in
this manual will provide you descriptions of common potential prob-
lems which you may encounter.

PRELIMINARY STEPS

This program will not run initially until you have installed it for
your system. Since there are several models of Apple // computers
and thousands of different combinations of modems, video cards,
serial cards, clock cards, and printer cards, you will have to tell
this program which hardware you have installed before you can
run it.

1) Use the DOS 3.3 or ProDOS disk depending on which operating
system you prefer. Do not mix the programs from one type of oper-
ating system with the programs associated with the other type of
operating system. Be sure the work disk and install disk are label-
led properly and the install disk is write-protected.

2) Boot the install disk to run the INSTALL program. You must
run the install program on the computer you will be using to run
MODEM MGR. Don't use a different computer for the installation.

3) Follow the prompts and answer the queries issued by the INSTALL program. Insert the work disk or the install disk into the disk drive when you are directed to do so.

4) When the main installation menu appears, select option 1 to install the video driver. Select the video card you are using and specify the normal screen (not the split-screen) when asked. If you are using a video card in an expansion slot, you must specify the slot number when asked. Answer Y (for Yes) when the program asks you if you want to use the driver you have selected.

5) Select option 2 on the main installation menu to install the modem driver. If you are using an internal plug-in modem, you will have to specify the type of plug-in modem card and the slot it is in. If you are using an internal serial or communications card and an external modem, you must not only specify the type of card and the card slot, but also the type of modem. If you are using a multi-function card, read the query carefully to determine whether you should specify the actual physical slot or the phantom mapped slot. Answer Y (for Yes) when the program asks you if you want to use the driver you have selected.

6) You must specify a video driver in order to run the program. You must also specify a modem driver in order to use the program for communications. You do not have to specify a clock or printer driver. Do not perform the printer driver installation until you have read Chapter 12.

7) Do not change any of the defaults (option 7 on the main installation menu).

8) After you specify the desired drivers, select option 9 on the main installation menu, insert the work disk into the drive, and save the newly installed program.

9) You will now have a work disk which has been configured for your system. You do not need the install disk again until you want to re-install or change some program parameters.

BOOTING THE PROGRAM

If you are using an external modem, apply power to the modem
before you boot the work disk. If your modem has configuration
switches, set the modem carrier detect signal (DCD) permanently on
and set the modem to ignore the DTR signal (DTR always on). You
may use different settings later, but set them as described for this
first-time initial run. If your modem has a baud rate switch, set the
switch to the desired baud rate.

Boot the work disk. If you see no message or a message "MUST
INSTALL VIDEO DRIVER", then you have not installed the video
driver. Run the INSTALL program and install a video driver.

If you installed the correct video driver, the screen should clear and
the hardware you specified in the install program should be listed.
After a pause, the program will load some default files if they are
found on the disk. It does not matter if those files are not found.

Finally, the screen will clear again and you will see a menu of the
terminal commands. This menu is shown in figure 6-1. If you see a
dashed line across the screen about three-fourths down from the top,
you have installed the split-screen video driver by mistake. Run
the INSTALL program again and specify the normal screen.

If the program does not load as described, read Chapters 3 and 4.
Check your hardware connections and proceed through the installa-
tion described in those chapters.

TERMINAL MODE

If the menu of terminal commands appears, you are in the terminal
mode. In this mode you can communicate with another system. How-
ever, you must first make a connection with that system. To make a
connection, you must issue certain commands. To enter a command,
you must be in the terminal **command** mode. Type the [ESC] key
until a "Command?-->" prompt appears. Enter a question mark (?)
and observe the command menu is displayed again. When you typed
the [ESC] character, you placed the program in the terminal **command**
mode and when you typed the ? character, you entered the command
which displays the command menu.

Look at each command listed on the menu and observe that each command is executed by typing a single letter, number, or punctuation character when the "Command?-->" prompt is displayed. (The ? command is not shown on the menu.)

Enter the following commands (remember to type [ESC] for the "Command?-->" prompt) and observe what happens:

B   The B command toggles the capture buffer on or off.
C   The C command clears the buffer.
S   The S command displays the number of characters in the
         buffer and the amount of space left.

Enter the D command and observe the disk functions menu appears. Now enter a C to see a disk catalog. Note that this C command is a disk functions command and is not the same as the C command issued as a terminal command. You may think of this as being a DC command since that is the sequence of characters you typed to get the disk catalog.

If you don't want to enter a command, enter [RETURN] instead and you will return to the terminal mode.

Enter the M command and select the baud rate corresponding to the baud rate your modem supports. Enter the J command and select the number of data bits, parity, and number of stop bits. If you don't have a preference, use 8 data bits, no parity, and one stop bit. This combination may be shown as "8+1+none" or "8+1+n" or "8n1".

If you have a modem which can dial a number under program control, enter the T command. When the "Enter -->" message appears, enter the telephone number of your favorite system followed by [RETURN]. If your modem supports tone dialing, enter the letter T before the first number. To exit without dialing, type [ESC] (not [RETURN]). If your modem does not support dialing, dial the number manually on a telephone set connected to the same phone line.

If your modem has a speaker which allows you to hear the call in progress or if you have a telephone set on the same phone line, you can hear the other system answer your call. After that system an-

swers, it should transmit a carrier tone. Your modem should respond by turning on its carrier. (Some modems require you to manually set a switch on to enable the carrier). You are now connected to the other system. If you used a telephone set on the same phone line to dial, hang that phone up.

You can now communicate with the other system. Any characters transmitted to you from the other system will be displayed on your video screen. Any characters you type on your keyboard will be transmitted to the other system. You may enter [ESC] B at any time to toggle the capture buffer on or off. If the capture buffer is on, all characters received will be saved in the buffer.

When you are finished, type [ESC] to get into the terminal command mode and enter the H command to hang up your modem. Some modems will not respond to a hangup command, but will perform a hang-up when the other system disconnects or when a switch on the modem is set to off.

If you captured some text to the buffer and you wish to view the text, enter the V command. If you wish to save what you have cap-tured to a disk file, enter the following disk-write command sequence. Don't type the spaces which are included for clarity.

[ESC] D W filename [RETURN]   (if DOS 3.3)
[ESC] D W pathname [RETURN]   (if ProDOS)

In other words, enter [ESC] followed by D followed by W followed by a "filename" or "pathname" of your choice followed by [RETURN]. Several prompts and menus will be displayed while you are typing through this sequence. You can pause to read the prompts or type the sequence as fast as you can. With both DOS 3.3 and ProDOS, you may use the S# and D# options to specify another slot or drive. For example:

[ESC]DWMYFILE,S6,D2[RETURN]

This will save the buffer to a file called MYFILE on the disk asso-ciated with slot 6 and drive 2.

OTHER CHAPTERS

Although you may have managed to use the brief instructions in this chapter to conduct communications with another system, you have just barely exercised the total capabilities of this program. It is recommended you proceed to Chapter 3 and verify you have properly installed your hardware. Although this may seem unnecessary after you have used the system to communicate successfully, there are several equipment connections you must make properly in order to utilize some of the more advanced features of this program. You must also avoid some common equipment connections which can cause problems.

Next, read Chapter 4 and perform the INSTALL program again to incorporate any additional features you need and to set the defaults to match your custom requirements.

Read Chapter 5 for a full description of the operational features of the terminal program. The remaining chapters provide additional information on some of the major terminal mode capabilities.

C H A P T E R   3

H A R D W A R E   C O N N E C T I O N S

This chapter covers the inter-connections between your communica-
tions hardware and your computer. You must make these connections
properly before this program can be used effectively. This software
will not work if your hardware is not correctly interfaced. In most
cases, you will use this program with a modem. Therefore, this
chapter will primarily describe the interface in terms of a modem
connection. If you are connecting directly to another computer or
something other than a modem, the same description will generally
apply.

The major purpose of this chapter is to provide you information to
connect your modem to support communications with this program.
Therefore, the instructions in this chapter will promote the setting
of all control or handshake connections between the modem and the
computer to the "on" state. This will reduce the potential problems
in getting the basic receiving and transmitting functions operational.
After you have been able to satisfactorily perform receiving and
transmitting, the control connections can be re-configured to support
more advanced features which require handshaking.

If you use a Brand W cable to connect a Brand X external modem to
a Brand Y serial card in a Brand Z computer, you should not expect
to automatically achieve all of the correct connections just by plug-
ging everything together. This chapter will provide broad guidelines
so you can determine how to connect the signal lines for communi-
cations. Some specific information will be presented on common
hardware peripherals. However, it is impossible to individually de-
scribe all of the connections for all of the possible combinations of
modems and serial cards in this manual. It is your responsibility to
inter-connect your equipment with your computer.

In some cases, you can perform the hardware installation by simply
plugging a card into the computer. In other cases, it will require
the preparation of a special cable or the modification of an exist-
ing cable.

If you have an external modem and have already used it to success-
fully communicate with other systems, then you probably have most
of the required interfacing completed. However, you may still have
some missing wiring connections which are necessary to support all
of the features offered by this program. There may also be some
unterminated connections which can cause noise pickup and erratic
operation.

INTERNAL PLUG-IN MODEM CARDS

If you have an internal plug-in modem card, all you have to do is
set the card switches (if any) according to the modem instruction
manual, attach any cables supplied with the card, and plug the card
into the computer. (Be sure the computer power is turned off first).
If you have a Prometheus ProModem 1200A internal plug-in modem,
set switch 3 to the ON position to force a high carrier-detect signal.

Some internal modems consist of two cards. Remember which slots
you have used for the modem cards so you can specify them when
you run the INSTALL program. If you have an internal plug-in
modem, skip over to Chapter 4 where the various modems are des-
cribed. Read the section which covers your modem.

INTERNAL SERIAL OR COMMUNICATIONS CARD

If you are using an external modem with an internal plug-in serial
or communications card, read the serial card instruction manual
to determine how the default baud rate is set. Usually there are
switches or jumpers on the card provided for setting the default
baud rate. Some cards also have switches or jumpers to set the de-
fault communications parameters (number of data bits, number of
stop bits, parity). Unless you have some other preference, set the
switches for 8 data bits, 1 stop bit, and no parity.

Although some cards are supplied with utility programs to set the
communications parameters, these settings are lost when the computer
is turned off. There is no need to run any of these utility programs
before you run MODEM MGR. One exception is the utility program
used with cards which can store the settings permanently in non-
volatile RAM. If your card has non-volatile RAM, run the utility

program to set and save the default communications parameters.

Perform the following steps before installing the plug-in serial card.

1) Set the card switches or jumpers to the default baud rate.

2) Set the card switches or jumpers for the desired default number of data bits, number of stop bits, and parity. Some cards do not have the capability to permanently set these communications parameters. MODEM MGR will set the defaults for those cards when it is run.

3) Verify the card is configured for a "modem" connection and not a "printer" connection. Some cards have a switch, jumper, or plug to make this choice, while other cards may provide a different cable connector for each type of connection.

4) Read the individual description pertaining to your serial card in Chapter 4 and set the handshake switches or jumpers accordingly.

If you have a multi-function card which combines several functions (serial, parallel, clock) on one card, follow the instructions provided with the card to define which slot the serial function has been assigned to. The earlier discussion on internal serial cards applies to the serial function of these cards also. Read the individual description for your multi-function card in Chapter 4.

EXTERNAL MODEMS

For purposes of discussion in this manual, external modems will be classified into three major types.

1) "Smart" modems. These are modems which have a built-in processor and firmware to control all of the major modem functions. These modems accept character string commands for automatic baud rate and communication parameter selection, dial, answer, hangup, and status reporting. The Hayes Smartmodem and dozens of "Hayes-compatible" modems are in this category. The Novation Smart CAT and the Prometheus Promodem 1200A modems are also "smart" modems.

2) Auto modems. These are modems which can answer and hangup automatically, but do not have dialing capability. Some functions must be set with manual switches. The Vadic 3451 and Novation Auto-CAT modems are in this category.

3) Dumb modems. These are modems without dialing capability. You must manually control these modems with switches to answer, go online, or hangup. Most acoustic modems are in this category.

Auto and dumb modems will also be referred to as "non-smart" modems.

Set the baud rate switch on the modem (if any) to match the baud rate of your serial card. If your modem has a switch to control the carrier detect output (DCD), set it so the carrier detect signal is always on. If your modem has a switch to control the response to the data terminal ready (DTR) signal from your computer, set it so DTR is always on and the modem ignores that signal from your computer. Later you may wish to set these switches differently, but set it as described for now.

DB-25 CONNECTOR

Most modems and serial card cables use a D-shaped connector approximately 1-1/2 inches wide called a DB-25 connector. This connector has become a standard for serial connections. The DB-25 connector has two rows of contacts which are either all pins or all sockets. One row has 13 contacts and the other row has 12 contacts. Often the contact numbers (from 1 to 25) are embossed on the face of the connector.

In some connectors, several of the contacts may be missing. The connector has the capability to handle up to 25 wiring connections. Typically, there are much less than 25 connections required, so the cable attached to the connector may have anywhere from three to 25 wires.

A connector with pin contacts is called a "male" connector and a connector with socket contacts is called a "female" connector. To mate two connectors together, one must be a male connector and

the other must be a female connector. The connector attached to a cable is sometimes called a plug while the connector attached to a hardware unit is sometimes called a jack. To avoid confusion, these two terms (jack, plug) will not be used again in this manual.

Some hardware units do not use the DB-25 connector. For example, the Apple //c and some serial cards use a round 5-contact DIN connector. The Apple 300 and 1200 modems use a nine-contact DB-9 connector. If you are using equipment with any of these connectors, refer to the description of your hardware unit in Chapter 4 to determine which pins should be interfaced.

CABLES

There are two common types of cables used with DB-25 connectors. One type consists of individual wires bundled together inside a round sleeve. (Sometimes a metallic braid or sheath encloses the wires for shielding). The other common type of cable is a flat ribbon cable. The physical characteristics of a ribbon cable are such that connections are made straight across from connector to connector without crossovers. In other words, each wire connects the contact having the same number on both connectors. The non-ribbon type of cable can be connected so the wires terminate at any contact desired. The wires can even be looped back to terminate both ends at different contacts on the same connector.

If you inspect the DB-25 connector and cable, you can sometimes visually determine which contacts are connected. If a ribbon cable has 25 wires then all contacts 1 through 25 are probably connected. If the ribbon cable has only 15 wires, then contacts 1 through 8 and 14 through 20 are probably connected. If the connector has less than 25 contacts installed, you can probably assume the installed contacts are all connected. For example, if the connector has only pins 1, 2, 3, 4, 5, 6, 7, 8, and 20, those nine contacts are probably all connected. It is easy to determine which pins are installed on a male connector, while you may have to study a female connector carefully to determine which sockets are installed.

Although there are some exceptions, most external modems have a female DB-25 connector. Some serial cards are equipped with a

short cable terminated in a DB-25 connector which normally mounts
on the rear wall of the computer. A longer cable must be used to
connect between this connector and the modem connector. Some
serial cards have a cable which is long enough to run directly to
the modem connector. If the cable has a male DB-25 connector, it
will mate with the female DB-25 connector on the modem. However,
the fact that the two connectors mate does not necessarily mean the
correct signals have been interfaced.

In the remainder of this manual, a connector contact will be re-
ferred to as a pin although it may be either a pin or a socket. We
will try not to use the signal or device names defined in the RS-232-C
interface standard when discussing serial card connections because
it increases the confusion and some of the names become meaning-
less when the communications software defines the control functions.

Instead, we will refer to connector pin numbers because the ultimate
problem will be to determine which pin to make a connection to. We
will use RS-232 names occasionally when we are describing the
modem connector.

GROUND (COMMON) CONNECTION

Pin 7 on the DB-25 connector is always used for the signal common
or ground connection. A wire must always be provided to connect
pin 7 on one connector to pin 7 on the other connector.

DATA LINE CONNECTIONS

Usually the modem DB-25 connector uses pin 2 for data from the
serial card output and pin 3 for data to the serial card input. If
the connector on the cable from the serial card has pin 2 assigned
for serial card data output and pin 3 assigned for serial card data
input, then the two data lines will be properly interfaced when the
connectors are directly mated.

There are some cases where the serial card pin assignments will be
reversed. That is, the serial card input will be on pin 2 and the
serial card output will be on pin 3. If the pin assignments are re-
versed, the data lines will not be properly interfaced and communi-

cations cannot be achieved when the connectors are mated directly. Those serial cards with reversed pin assignments for the modem function will be mentioned in the description of the individual cards in Chapter 4.

If the pin functions are reversed, then something must be done to correct the reversal. There are several ways of doing this:

1) If the modem has a reversing switch for pins 2 and 3, you may set it to correct the reversal.

2) If the cable connector has removable pins, you may remove the pins from the connector and re-install them to correct the reversal. You may need a special extraction tool to remove the pins and you may have to perform some disassembly and re-assembly of the connector body.

3) If the cable is a non-flat cable with separate individual wires, you may be able to cut and cross-splice the two wires. Be sure to tape the connections so the spliced conductors are not exposed to potential short-circuits.

4) If the cable is a flat ribbon cable, you may be able to strip the individual wires out of the cable and cross-splice them. Be sure to tape the connections so the spliced conductors are not exposed to potential short-circuits.

5) You may use an adapter cable with cross-over connections in series between your cable and modem.

6) You may install a break-out box or RS-232 tester in series between your cable and modem. This device allows jumpers or provides dip switches to correct the reversal.

7) You may use a "smart" cable. This uses an electronic device built into the connector to sense and correct a reversal.

After you have interfaced pins 2, 3, and 7 correctly, you may be able to communicate with only these three signals connected.

If you have a three-conductor cable, you can sometimes use it successfully to connect your modem to your serial card if all of the serial card control inputs are held "high" by internal pull-ups and the modem does not require a "high" input from your serial card. However, if you use a cable which provides only three connections, you will not be able to use carrier control. Also, if you have a "non-smart" modem, you will not be able to hangup under program control.

SERIAL CARD CONTROL INPUTS

Most serial cards have a handshake or control input which must receive a "high" or "on" or "asserted" control signal in order to enable the serial card receiver. Instead of using RS-232 terminology, we will call this input the receiver control input. Many serial cards also have another control input which must be set "high" in order to enable the serial card transmitter. We will call this the transmitter control input. If your data lines are properly interfaced but you cannot receive and/or transmit data to the modem, you may have a "low" control signal on one of these control lines.

These control inputs usually receive a "high" signal from the modem when valid two-way communications can be conducted. If these control lines are not connected to the modem or are connected to the wrong pins on the modem connector, they may be forced to the "low" state which disables communications to or from the serial card.

In some serial cards, the control lines are wired internally to pull-up circuits so they are forced "high" when there are no external control wires attached. This design enables two-way communications with the modem even if the control signals from the modem are not wired to the card. If an external control signal is wired to the card connector, it will over-ride the pull-up circuit.

Some serial cards provide a switch or jumper which allows you to disconnect the control input from the card DB-25 connector and connect it to a pull-up circuit. This design forces the control line "high" regardless of the signal applied to the control connector pin.

In some cards, there are no pull-up circuits provided so you must wire the input to a modem or serial card output which is either permanently "high" or goes "high" whenever valid communications can be performed.

The receiver and transmitter control input pins are listed in the description of the various serial cards in Chapter 4. If your serial card has one or both of these inputs, they must be "high" or pulled-up when you wish to conduct two-way communications.

If you enable carrier control (by the INSTALL program), the serial card receiver control input will be used by this program for carrier status. If you wish to implement carrier control, the carrier-detect signal from the modem must be wired to the serial card receiver control input. If you don't want carrier control, this control input must be kept permanently "high". Chapter 11 describes the advantages and disadvantages of carrier control and provides instructions on properly interfacing the modem carrier-detect output to the receiver control input.

MODEM MGR requires the transmitter control input always be kept "high".

The control inputs are not always assigned to the same pin on the serial card DB-25 connector. The assigned pins are listed in the individual descriptions of the serial cards in Chapter 4.

SERIAL CARD CONTROL OUTPUT

Most serial cards have a control output which is set "high" or "low" by the software. MODEM MGR usually sets this output permanently "high" except when a non-smart modem is used. The only way to hangup some non-smart modems under program control is to force the modem DTR control input (usually pin 20 on the modem DB-25 connector) to "low". If you have a non-smart modem which supports this feature, refer to the description of your serial card to determine which pin on the serial card to connect to the modem DTR pin.

If you are using a "smart" modem, this program handles hangup in a different manner and does not use the serial card control output, so

this serial card output will be set "high". It can be connected to the modem DTR input or used as a "high" source for any other pin which must be kept "high".

MODEM CONTROL INPUT

As mentioned in the previous section, some modems have a DTR control input (usually on pin 20 of the DB-25 connector) which must be kept "high" to enable the modem to send or receive. The status of this input is sometimes displayed as a "TR" or "DTR" indication on the modem front panel. Earlier, it was mentioned that if there is a modem switch which allows the modem to disconnect this signal from its connector and internally set it "high", then it should be set "high". If you can never send or receive with the modem, insure this input is "high". If it is "low", set the switch or remove the external connection which is causing the "low" condition.

SERIAL CARD INPUT CONTROL PROBLEMS

If you suspect an incorrect handshake or control input is preventing you from conducting two-way communications with your modem, try to determine if the modem is possibly functioning in at least one data direction. The modem may not be currently capable of two-way communications, but may be capable of either transmitting or receiving.

Many modems have front-panel lights which indicate when data is sent or received. Run this program and be sure the baud rate matches the modem baud rate. Enter the terminal mode by typing [RETURN] after the "Command? --> " prompt. Type some characters on your keyboard. If your modem has a "SEND" or "SD" light and it blinks, you are transmitting to the modem and you can concentrate on solving the receiving problem.

Some modems have an echo or test mode which will send characters to your computer. Initiate this test mode and see if your computer is receiving characters from the modem. If the modem test characters are displayed on your screen, you can concentrate on solving the transmitting problem.

ENABLE RECEIVER

If you are unable to receive from the modem, the receiver control input on your serial card is probably set "low". Use the following methods to force the serial card receiver control input to the "high" or "on" state.

1) Refer to your serial card instruction manual or the description of your serial card in Chapter 4. Determine if you can set a switch or remove a jumper to disconnect the serial card receiver control input from the DB-25 connector and set it permanently "high". If so, perform the steps required to disconnect it and set it "high".

2) If you cannot disconnect the receiver control input from the connector, refer to the description of your serial card in Chapter 4 and determine which pin the receiver control input is on and whether it has an internal pull-up circuit or not.

3) If your serial card receiver control input has an internal pull-up circuit, remove the modem wire connection to this pin, if possible.

4) If you cannot remove the wire, or if your serial card receiver control input does not have an internal pull-up, you must wire the pin to a "high" signal. Wire it to the carrier-detect output (usually pin 8 on the modem connector) or to any pin on the modem or serial card which is always "high". Refer to the modem and serial card manuals to determine which pins are set permanently "high".

ENABLE TRANSMITTER

If you are unable to transmit to the modem, the serial card transmitter control input is probably set "low". Use the following methods to force the serial card transmitter control input to the "high" or "on" state.

a) Refer to your serial card manual or the description of your serial card in Chapter 4. Determine if you can set a switch or remove a jumper to disconnect the the serial card transmitter control input from the DB-25 connector and set it permanently "high". If so, perform the steps required to disconnect it from

the connector.

b) If you cannot disconnect the transmitter control input from the connector, refer to the description of your serial card in Chapter 4 and determine which pin the transmitter control input is on and whether it has an internal pull-up circuit or not.

c) If your serial card transmitter control input has an internal pull-up circuit, remove the modem cable wire connection to this pin, if possible.

d) If you cannot remove the wire, or if your serial card transmitter control input does not have an internal pull-up, you must wire the pin to a "high" signal. Wire it to a pin on the modem or serial card which is always "high". Refer to the manual on the modem and serial card to determine which pins are set permanently "high".

UNTERMINATED CONTROL (HANDSHAKE) WIRES

Check your cable to insure that all wires connected to the transmitter or receiver control inputs on your serial card are connected to a control source at the modem end. If any control wire is not connected to a control output at the modem end, terminate it on a "high" signal or remove the wire.

Unterminated wires behave like antennas which receive noise spikes from the data lines. Data reception can be momentarily disabled by the noise transients. This is sometimes so severe no characters can be received. In other cases, the symptoms are subtle and you will not notice any problems at low baud rates or when communications involves mostly receiving or mostly transmitting. However, at high baud rates with simultaneous receiving and transmitting, some incoming characters will be lost.

The use of a shielded cable will not prevent this problem because the source data wires and the victim handshake wires will still be bundled together within the shield. This problem will exist even with a pull-up circuit on the serial card because most simple resistor pull-up circuits do not provide adequate noise immunity when a long unterminated wire is connected.

Unterminated wires often occur when a break-out box or RS-232
tester is inserted between the modem and the serial card. This type
of tester allows lines to be opened. This is necessary for testing or
trouble-shooting, but be sure to remove the tester or terminate all
control lines after the testing is completed.

The importance of avoiding unterminated handshake lines cannot
be over-stressed.

PULSE DIALING CONTROL

Some auto modems have an input which allows control of the modem
hook switch. If this input is compatible with the][+ or //e game
port annunciator TTL output, this input can be toggled by the com-
puter to provide pulse dialing. For example, the Novation Auto-CAT
modem has this signal on pin 25 on the modem DB-25 connector and
the Novation J-CAT modem has this signal on pin 7 of the modem
edge connector. If this pin is connected to pin 14 on the game port
I/O connector and the auto modem driver is installed, program con-
trol of pulse dialing will be supported.

Some modems require their DTR input (pin 20) be held low while
this type of dialing is being performed. The auto modem driver
lowers the serial card output control signal while dialing, so this
control signal can be used to control the auto modem DTR input.

HARDWARE PROBLEMS

After dealing with many cases where receiving and/or transmitting
could not be achieved with this software, we have found the follow-
ing have been the major causes:

1) The modem and serial card were set for different baud rates.

2) A special modified cable must be used between the modem and
serial card.

3) The switches or jumpers on the serial card were set to the wrong
position.

Since these are common problems, you should investigate these possi-
bilities if you cannot receive and/or transmit. As we mentioned
earlier, it is your responsibility to inter-connect your hardware to
operate properly. We have provided you with some information on
connecting your communications equipment and setting the switches
or jumpers on your hardware, but we cannot support any hardware
problems you have. Our support is limited to software problems.

Although we have found that practically all of the communications
hardware available for the Apple // personal computers perform
very well, some of these devices require additional configuration or
special cabling before they can be used in even a simple basic (no
carrier control) environment. If you purchased two pieces of hard-
ware that will not work together in a simple configuration until you
modify the cabling between them, the last thing you should blame is
the software.

C H A P T E R   4

COMMON SERIAL CARDS AND MODEMS

This chapter describes some of the common communications cards, serial cards, and modems which are supported by MODEM MGR. The descriptions cover the current model of each unit. The manufacturer may change designs, so refer to your instruction manual if you have a different version.

INTERNAL PLUG-IN MODEMS

This section will describe some of the modems which are available as internal plug-in cards. You do not have to use many cables when you install one of these internal modems so installation is relatively simple. Refer to your modem manual for installation procedures.

Most internal plug-in modem cards have built-in firmware which provides some communications capability without requiring you to load a program from disk. These capabilities are not as elaborate as those provided by a full-featured communications program, but you can use them to determine if the card is working properly. MODEM MGR does not use the firmware routines and any commands associated with the modem firmware are not recognized. For example, firmware commands such as PR#2, CTRL-A, and CTRL-F will not work when MODEM MGR is running.

Some manufacturers of internal modem cards provide a communications program on disk. Any communications characteristics you set when you run the disk program or the modem card firmware will not be retained when MODEM MGR is run. For example, baud rate, line feed insertion, duplex mode, and upper/lower case are initialized by MODEM MGR regardless of the settings previously used with the manufacturer's disk or firmware program.

Unless otherwise stated, MODEM MGR will support dial, answer, hangup, unattended operation, and answer/originate selection with all of the plug-in modems listed in this section. When a connection is made, this program will insert a LF character into the receive

buffer. Carrier control will be supported by this program if you have enabled it with the INSTALL program. The default baud rate will be the highest rate supported by the modem. Unless otherwise stated, all internal modem cards use 6850 devices.

HAYES MICROMODEM II

The Hayes Micromodem II provides 110 or 300 baud communications and supports pulse dialing. This modem consists of a plug-in card and an external microcoupler unit. The card is connected with a cable to the microcoupler and the microcoupler is connected with a cable to the phone line. In addition to the normal status messages, MODEM MGR generates the following additional status messages for this modem: RING, CONNECT, and NO CARRIER.

HAYES MICROMODEM IIE

The Hayes Micromodem IIe modem provides 110 or 300 baud communications and supports pulse or tone dialing. This modem consists of a single plug-in card. In addition to the normal status messages, MODEM MGR generates the following additional status messages for this modem: RING, CONNECT, and NO CARRIER. To mute the speaker when dialing, enter a minus (-) as the first character to dial.

NOVATION APPLE-CAT II

The Novation Apple-CAT II modem supports tone or pulse dialing and baud rates of 50, 75, 110, 150, 300 and Bell 202 (half-duplex) 1200 baud. If you add the 212 upgrade card, this modem will also support Bell 212A (full-duplex) 1200 baud. In addition to the normal status messages, MODEM MGR generates the following additional messages for this modem: RING, CONNECT, and NO CARRIER. (NO CARRIER is not used in the 202 mode). This modem does not use a Type 6850 device.

If you have installed the 212 upgrade card and you are installing either the 300/1200 or 202 modem driver, you will have to specify the location of the 212 card as well as the main card when the INSTALL program is run. You must specify whether the 212 card is installed in a slot or used in the "slot-saver" configuration. If you have installed it in a slot, you must specify which slot it is

in. If you move this card in or out of a slot or move it from one
slot to another, you will have to run the INSTALL program again
and re-install the modem driver with the new slot information.
Since two card slots may be involved, be sure to specify the correct
slot number for each card when the INSTALL program is run.

You have a choice of three different drivers in the INSTALL pro-
gram. If you don't have the 212 card, you should use the 300 baud
driver. This driver supports 50 to 300 baud. If you have the 212
upgrade card, you should use the 300/1200 baud driver. This dri-
ver supports both 300 and Bell 212A 1200 baud.

The third Apple-CAT driver supports the Bell 202 600 or 1200 baud
half-duplex mode. You may use this driver even if you don't have
the 212 card. The other system you are communicating with must
also be using the same communications format. Use the terminal F
command to select half-duplex when you are using this driver.

MODEM MGR provides semi break-in keying in the 202 mode so
two-way communications can be efficiently accomplished with
another user who has the same type of modem and program. When
you type a character on your keyboard, your 202 transmitter carrier
will be automatically enabled and your typed character will be
transmitted. If you stop typing for a period of longer than approx-
imately one second, your carrier will be switched off and the other
user can transmit to you. Pause for a slight instant after you type
the first character to allow time for carrier switching.

Some communications operations do not have to be simultaneously
two-way so you can conduct those operations with other 202 users
as long as both of you do not transmit at the same time. If you
have a telephone handset connected to the CAT modem card, you
can hear the carrier when the other user is transmitting. You
can toggle the handset on or off by typing a [CTRL] P.

You can also use the Bell 202 driver in the unattended mode and
with XMODEM or MMGR protocol file transfers. In these modes,
the transmitter carrier stay-on time will be shortened from one
second to a fraction of a second whenever a programmed trans-
mission occurs. This will reduce the delay between transmissions.
If you are communicating with an unattended 202 system, you must

be careful not to transmit while the unattended system is transmitting.

One advantage of this 202 mode is there is no carrier when the modems are not transmitting. When both modems are in the receive state, both users can carry on a voice conversation with telephones on the same line without having to switch modem modes. However, neither user should speak on the phone while either modem is transmitting.

PROMETHEUS PROMODEM 1200A

Do not confuse this internal plug-in modem with the ProModem 1200, which is discussed later in the section on external modems. The 1200A is not only an internal plug-in modem, it is also a "smart" modem. This modem supports 110, 300, or 1200 baud and provides pulse or tone dialing. This modem uses a Type 6551 device. In addition to the dialing commands supported by MODEM MGR, you can also use the following command characters in the dial string:

R   Switch to answer mode after dialing
W   Wait for dial tone
;   Return to "smart" command mode after dialing

This modem has several configuration switches on the CPU card. Set switch 1 to ON to ignore the DTR input. If you are not using carrier control, be sure switch 3 is set to ON. If you are using carrier control, set switch 3 to OFF.

When you specify the modem card slot in the INSTALL program, be sure to specify the slot the modem CPU card is in. This is the card with the speaker on it. If the SPU card is in a slot, you do not have to specify that slot.

Although this modem has a built-in clock, its registers are not accessible through the computer card bus so MODEM MGR cannot provide continuous time-of-day or elapsed time display with this clock. However, you can set and read this clock using the AT@T commands as described in the modem manual. You may use the modem "smart" AT commands to access some modem features like setting the clock, reading the clock, speaker control, or modem testing. However do not change anything that affects the duplex, command echo, result

codes or the escape code (+++).

SSM OR TRANSEND MODEMCARD

The Transend Modemcard provides 110 or 300 baud communications and supports pulse or tone dialing. This modem consists of a single plug-in card. In addition to the normal status messages, MODEM MGR generates the following additional status messages for this modem: RING, CONNECT, and NO CARRIER. This program uses the Apple speaker to monitor during dialing until a connection occurs. You may mute the speaker while dialing by entering a minus sign (-) as the first character to dial.

ZOOM MODEM][E

The Zoom Modem][e provides 110 or 300 baud communications and supports pulse or tone dialing. This modem consists of a single plug-in card. In addition to the normal status messages, MODEM MGR generates the following additional status messages for this modem: RING, CONNECT, and NO CARRIER. If you want to mute the speaker while dialing, enter a minus sign as the first character to dial.

ZOOM NETWORKER

The Zoom Networker modem supports 110 and 300 baud. This modem consists of a single plug-in card with an external switch. In addition to the normal status messages, MODEM MGR generates the following additional status messages for this modem: CONNECT and NO CARRIER. Dial, answer, and hangup must be performed manually. Therefore, this program will not support the terminal commands H, O, T, U, and W with this modem.

INTERNAL PLUG-IN SERIAL CARDS

This section will describe some of the popular plug-in serial or communications cards supported by MODEM MGR. The cards commonly available for the Apple computer fall into four general classifications based on the type of communications device used. An inspection of the card, card schematic, or card parts list will show you which type of device is used.

A Type 2651 card uses a 2651 device and can provide you software selection of 16 of the more common baud rates from 50 to 19200 baud. Select any one of these rates by using the M command in the terminal command mode. There are several combinations of number of data bits, number of stop bits, and type of parity which you can use. You may select from eight of these combinations by using the J command in the terminal command mode.

A Type 6551 card uses a 6551 device and can provide you software selection of 15 of the more common baud rates from 50 to 19200 baud. Select any one of these rates by using the M command in the terminal command mode. There are several combinations of number of data bits, number of stop bits, and parity which you can use. You may select from eight of these combinations by using the J command in the terminal command mode.

The Type 6850 card uses a 6850 device. On most Type 6850 cards, you may choose between two software-selected baud rates. You can specify one of the two baud rates (usually from 50 to 19200 baud) by setting switches on the card. The other baud rate will be one-fourth of the baud rate you have selected. For example, if you set the card switches for 1200 baud, a choice of 1200 or 300 baud will be available when you use the M command in the terminal command mode. There are eight different combinations of number of data bits, number of stop bits, and type of parity which you can select. You may select any of these eight combinations with the J command in the terminal command mode.

The Type 8251 card uses a 8251 device. MODEM MGR supports only one Type 8251 card (Quadram Multicore). This card provides software selection of eight baud rates from 150 to 19200 baud. You can select any one of these rates by using the M command in the terminal command mode. There are several combinations of number of data bits, number of stop bits, and parity which you can use. You may select from eight of these combinations by using the J command in the terminal command mode.

COMMUNICATION PARAMETER DEFAULTS

If your serial or communications card does not provide some method to allow you to permanently set defaults, MODEM MGR will normally

default to 8 data bits, 1 stop bit, and no parity. You can change these defaults by using the INSTALL program to specify the communications command byte for Type 2651, 6850 and 8251 cards. For Type 6551 cards, you can specify these defaults along with the default baud rate by defining the communications command and control bytes.

Usually these serial cards have built-in firmware which provides some communications capabilities. You can run the serial card firmware program by typing a PR#n and/or an IN#n, where n is the serial card slot number. The capabilities provided by the card firmware are not as elaborate as those provided by a full-featured communications program, but you can use these capabilities to determine if the card is working properly. MODEM MGR does not use the firmware routines and any commands associated with the serial card firmware are not recognized.

Some manufacturers of serial cards provide a communications program on disk. Any communications characteristics you set when you run the disk program or the serial card firmware will not be retained when MODEM MGR is run. For example, baud rate, line feed insertion, duplex mode, and upper/lower case will be redefined by MODEM MGR regardless of the previous settings.

CONTROL INPUTS AND OUTPUTS

Unless we state otherwise, any discussion in this chapter about the serial card connector will refer to the DB-25 connector on the end of the cable provided with the card. The serial card output will be on pin 2 and the input will be on pin 3 of the DB-25 connector unless we point out any differences.

Most serial cards have a receiver control input which enables or disables the receiver. This control input will be used by MODEM MGR for the modem carrier-detect signal if carrier control is enabled. Many serial cards also have a transmitter control input which enables or disables the transmitter. This control input must be kept "high".

Most serial cards also have a control output. If your modem DTR input requires a "high" signal, this control output can be used to

provide this signal. MODEM MGR usually sets this output "high" except during software-controlled hangup of an auto modem. You can use the control output as a "high" signal source if required.

Although these serial cards can also be used as serial printer interface cards, the following descriptions apply only when these cards are used with a modem.

APPLE //C

Although it is not a plug-in serial card, the //c serial interface can be considered as functionally similar to a Type 6551 card. Connect your modem to the five-pin round DIN connector (Serial Port 2) on the rear of the //c. The pin assignments are:

Pin 1   Control output
Pin 2   Data from //c to modem
Pin 3   Circuit common (ground)
Pin 4   Data from modem to //c
Pin 5   Receiver control input

These pin numbers follow Apple's convention of numbering the five pins consecutively (1-2-3-4-5). You will find another convention commonly used with these DIN connectors where the pins are numbered alternately (1-4-2-5-3). If you are constructing your own cable using DIN connectors, be sure to use the correct numbering system.

The receiver control input on pin 5 has an internal pull-up. If you want to use carrier control, connect the modem carrier-detect signal to pin 5. If you don't want to use carrier control, disconnect the signal to this pin or connect it to a continuously "high" signal. There is no transmitter control input.

Early versions of the //c computer do not have a dedicated crystal to develop the baud rate reference. The reference signal used is slightly off-frequency so errors will occur if you use some modems at high baud rates and/or high character sending rates. The Apple Modem 300 or 1200 will operate with the early //c computers with no problem. Later versions of the //c do not have this characteristic.

If you are using one of these early //c computers, you may need an Apple modem.

APPLE COMMUNICATIONS CARD

This is a Type 6850 card which does not have any control inputs or outputs. Therefore, you cannot use this card to support carrier control or force an auto modem to hang up. The two software-selectable baud rates are permanently set for 300 and 110 baud. You can achieve higher baud rates by modifying the card as described in your card manual.

APPLE SUPER SERIAL CARD

This is a Type 6551 card with several switches and a jumper block which provide a flexible configuration capability. You must install the jumper block so the arrow points up to the word MODEM. Set the switches to the desired default baud rate and communications parameters. When MODEM MGR is run, it will read the settings of these switches and set the defaults accordingly. However, if you have used the INSTALL program to set a non-zero value for the communications command byte, the values you have specified for the communications command and control bytes will override the switch defaults.

The receiver control input is on pin 8 and the transmitter control input is on pin 5. Both pins have internal pull-ups. The control output is on pin 4 and pin 20 is programmed to be a continuously "high" output. Switch SW2-7 should be set OFF. If you want to use carrier control, set switch SW1-7 to ON and connect the modem carrier-detect signal to pin 8. If you don't want to use carrier control, set switch SW1-7 to OFF to disconnect the receiver control input from pin 8.

APRICORN SERIAL INTERFACE CARD

This is a Type 6850 card with two cable connectors. Be sure to use the connector labelled MODEM. The receiver control input is on pin 6 and the transmitter control input is on pin 5. These pins do not have internal pull-ups, so they must both be held "high" by an external signal for two-way communications. If

you want to use carrier control, connect the modem carrier-detect signal to pin 6. The control output is on pin 4 and pin 20 is a continuously "high" output.

APRICORN SUPER SERIAL IMAGER CARD

This is a Type 6551 card with several switches which provide a flexible configuration capability. Set the switches to the desired default baud rate and communications parameters. When MODEM MGR is run, it will read the settings of these switches and set the defaults accordingly. However, if you have used the INSTALL program to specify a non-zero value for the communications command byte, the values you have specified for the communications command and control bytes will override the default values.

This card has two cable connectors. Be sure to connect the modem cable to the connector labelled MODEM.

The receiver control input is on pin 8. The transmitter control input is on pin 5. Both pins have internal pull-ups. If you want to use carrier control, connect the modem carrier-detect signal to pin 8. If you don't want to use carrier control, disconnect the signal to this pin or connect pin 8 to a continuously "high" signal. The control output is on pin 4 and pin 20 is programmed to be a continuously "high" output.

AST MULTI I/O CARD

This is a multi-function card which provides serial printer, serial modem, and clock functions on the same card. You must map each desired function to a card slot by installing jumpers into configuration blocks. You must also map one of the functions to the physical slot the card is in. Map the modem serial function to slot 2 or 3. Refer to the card manual for instructions in selecting the mapped slot assignments. Use these mapped slot numbers instead of the actual physical slot number whenever a slot number is requested by the INSTALL program.

The two serial sections of the card are both Type 6850 and there is a separate cable connector for each. Be sure to connect to the communications port connector and not the printer port connector.

The following applies to the DB-25 connector on the cable connected to the communications port connector. The receiver control input is on pin 6 and has an internal pull-up. If you want to use carrier control, connect the modem carrier-detect signal to pin 6. If you don't want to use carrier control, disconnect the signal to this pin or connect this pin to a continuously "high" signal. The control output is on pin 20. There is no transmitter control input.

CALIFORNIA COMPUTER SYSTEMS 7710 CARD

This is a Type 6850 card with pins 2 and 3 reversed when used with a modem. You must correct this reversal when you connect this card to a modem. The receiver control input is on pin 20 and the transmitter control input is on pin 4. These pins do not have internal pull-ups, so they must both be held "high" by an external signal for two-way communications. If you want to use carrier control, connect the modem carrier-detect signal to pin 20. The control output is on pin 5. Pins 6 and 8 have continuously "high" outputs.

CALIFORNIA COMPUTER SYSTEMS 7711 CARD

This is a Type 6551 card. Set the baud rate jumpers for the desired default baud rate. When MODEM MGR is run, it will read the position of these jumpers and set the default baud rate accordingly. However, if you have used the INSTALL program to set a non-zero value for the communications command byte, the value you have specified for the communications control byte will override the default baud rate.

Be sure the DTE/DCE header plug is plugged into the card block in the DTE configuration.

Set the "RTS" by-pass jumper to the OFF side. If you set the "DTR" handshake by-pass jumper to the ON side, the receiver control input will be on both pins 6 and 8. If you want to use carrier control, connect the modem carrier-detect signal to pin 6 or 8 and set the "DTR" handshake by-pass jumper to the ON side. If you don't want to use carrier control, set the "DTR" handshake by-pass jumper to the OFF side. This will pull the receiver control input high. There is no transmitter control input. The control output is on the pin

selected by the handshake select jumper. Do not place this jumper
on the pin 20 position. Pin 20 is programmed to be a continuously
"high" output.

MOUNTAIN HARDWARE CPS CARD

This is a multi-function card which provides parallel printer, serial
modem, and clock functions on the same card. Although you can
map each function to a phantom slot, it is not necessary to do so for
this program. Use the actual physical slot number of this card for
any of its functions whenever a slot number is requested by the
INSTALL program.

The serial section of the card is a Type 2651 card. The receiver con-
trol input is on pin 8 and the transmitter control input is on pin 5.
These pins do not have internal pull-ups so they must be set "high"
by an external signal for two-way communications. If you want to
use carrier control, connect the modem carrier-detect signal to pin 8.
The control output is on pin 4 and pin 20 is programmed to be a
continuously "high" output.

PRACTICAL PERIPHERALS SERIALL CARD

This is a Type 6551 card with several switches which provide a flex-
ible configuration capability. Set the switches to the desired default
baud rate and communications parameters. When MODEM MGR is
run, it will read the settings of these switches and set the defaults
accordingly. However, if you have used the INSTALL program to
specify a non-zero value for the communications command byte, the
values you have specified for the communications command and con-
trol bytes will override the default values.

Two cable connectors are provided. Be sure to connect the modem
cable to the connector labelled MODEM.

Set the Berg jumper on position 5. In position 5, the receiver control
input is on pin 8. The transmitter control input is on pin 5. Both
pins have internal pull-ups. If you want to use carrier control, con-
nect the modem carrier-detect signal to pin 8. If you don't want to
use carrier control, disconnect the signal to this pin or connect pin 8

to a continuously "high" signal. The control output is on pin 4 and pin 20 is programmed to be a continuously "high" output.

PROMETHEUS VERSACARD

This is a multi-function card which provides parallel printer, serial, and clock functions on the same card. Although you can map the parallel printer and clock functions to other slots, the serial function always appears in the actual physical card slot and you should specify this slot when you install the communications function with the INSTALL program.

The serial section of the card is a Type 6850 card. The receiver control input is on pin 6 and the transmitter control input is on pin 5. These pins have internal pull-ups. If you want to use carrier control, connect the modem carrier-detect signal to pin 6. If you don't want to use carrier control, disconnect any signal to this pin or connect this pin to a continuously "high" signal. The control output is on pin 4 and pin 20 is always a continuously "high" output.

QUADRAM MULTICORE CARD

This is a multi-function card which provides parallel printer, serial, clock, and extended memory functions on the same card. You must install this card in slot 1. Specify slot 1 when you install the serial communications function in the INSTALL program. MODEM MGR does not support the extended memory on this card except when it is used as a ProDOS RAM disk.

The serial section of the card is a Type 8251 card. The transmitter control input is on pin 5. There is no receiver control input. However, there is another type of control input on pin 6. Both pins 5 and 6 have internal pull-ups. If you want to use carrier control, connect the modem carrier-detect signal to pin 6. If you don't want to use carrier control, it does not matter if pin 6 is held high or low. The control output is on pin 4.

The manufacturer supplies this card with a ProDOS configuration program on disk. Use this configuration program to set the desired default modem baud rate and communications parameters for virtual

slot 2. After these have been set, save the settings permanently in the non-volatile RAM. Whenever you run MODEM MGR, it will read the contents of the non-volatile RAM and set the baud rate, number of data bits, number of stop bits, and parity to the communications settings you have permanently stored for virtual slot 2.

However, if you have used the INSTALL program to set a non-zero value for the communications command byte, the values you have specified for the communications command and control bytes will override the non-volatile RAM defaults. To use this override feature, set the value of the desired 8251 mode control word for the communications command byte and set one of the following values for the communications control byte.

Communications Control Byte	Baud Rate
00	150
01	300
02	600
03	1200
04	2400
05	4800
06	9600
07	19200

STREET ELECTRONICS ALPHABITS CARD

This is a Type 6551 card with a cable usually equipped with a five-pin round DIN connector. The pin connections are:

Pin 1   Control output
Pin 2   Output data to the modem
Pin 3   Circuit common (ground)
Pin 4   Input data from the modem
Pin 5   Receiver control input

These pin numbers follow Apple's convention of numbering the five pins consecutively (1-2-3-4-5). You will find another convention commonly used with DIN connectors where the pins are numbered

alternately (1-4-2-5-3). If you are constructing your own cable using DIN connectors, be sure to use the correct numbering system.

The receiver control input on pin 5 does not have an internal pull-up. If you want to use carrier control, connect the modem carrier-detect signal to pin 5. If you don't want to use carrier control, connect this pin to a continuously "high" signal. There is no transmitter control input.

TRANSEND OR SSM AIO CARD

This is a dual-function card which provides both a parallel printer and a serial function. The serial function uses a Type 6850 device. Both functions are associated with the physical slot the card is plugged into.

You can use the J terminal command to select the high or low baud rate. Set the rotary switch on the card for the desired high baud rate. Divide the labelled baud rate by four when you are using the low baud rate. If you have modified the card to double the baud rate, multiply the labelled baud rate by two when you use the high baud rate and divide the labelled baud rate by two when you use the low baud rate.

The receiver control input is on pin 8 and the transmitter control input is on pin 5. These pins have internal pull-ups. If you are using carrier control, connect the modem carrier-detect signal to pin 8. The control output is on pin 4 and pin 20 is always a continuously "high" output.

TRANSEND OR SSM ASIO CARD

This is a Type 6850 card with two cable connectors. Be sure to use the connector labelled MODEM. The receiver control input is on pin 8 and the transmitter control input is on pin 5. Both of these pins have internal pull-ups. If you are using carrier control, connect the modem carrier-detect signal to pin 8. If you don't want to use carrier control, disconnect any signal to this pin or connect this pin to a continuously "high" signal. The control output is on pin 4 and pin 20 is always a continuously "high" output.

VIDEX PSIO CARD

This is a dual-function card which provides both a parallel printer
and a serial function. The serial function uses a Type 6551 device.
You must assign one function to the actual physical card slot. You
can phantom the other function to another slot. When you are run-
ning the INSTALL program, specify the actual hardware slot.
MODEM MGR uses the actual slot and not the phantom slot to ac-
cess the card.

The manufacturer supplies this card with a utility configuration pro-
gram on disk. Use the utility program to set the desired default baud
rate and communications parameters. After you have set these, save
the settings permanently in the non-volatile RAM (NOVRAM) on the
card by pressing the save button. When MODEM MGR is run, it will
read the contents of the NOVRAM and set the baud rate, number of
data bits, number of stop bits, and parity accordingly.

However, if you have used the INSTALL program to specify a non-
zero value for the communications command byte, the values you
have specified for the communications command and control bytes
will override the NOVRAM defaults.

The card has two serial cable connectors. Be sure the cable is con-
nected to the connector labelled MODEM or DTE on the card.

If you install jumper J2 on the card to connect the right-most and
center pin of the three-pin set, the receiver control input will be on
pin 5. The transmitter control input is on pin 8. Both pins have
internal pull-ups. If you want to use carrier control, connect the
modem carrier-detect signal to pin 5. If you don't want to use carrier
control, place jumper J2 to connect the left-most and center pin of
the three-pin set. This will internally disconnect the receiver control
signal from pin 5. The control output is on pin 4 and pin 20 is pro-
grammed to be a continuously "high" output.

A few PSIO cards have a black dip switch instead of a red one. On
these, the phantom slot settings may differ from those given in the
manual. Use the utility program to display the status of the slot
assignments so you can verify your switch settings.

EXTERNAL MODEMS

If your modem has a DTR switch, we recommend it be set initially
so the modem ignores the DTR input. After you have verified you
can conduct two-way communications with this program, you may
wish to set this switch so it responds to the control output from the
serial card.

Connect the modem to your computer and power the modem on be-
fore you run MODEM MGR. If your modem power is interrupted
or turned on after the program has started, enter the terminal mode
hangup command (H) to initialize the modem.

Although your serial card may support a large choice of baud rates
and communications parameter combinations, most modems will sup-
port only a few of these. Refer to your modem manual to determine
which baud rates, number of data bits, number of stop bits, and type
of parity your modem supports.

When some modems answer a call, they will automatically change
their baud rates to match the baud rate of the calling system. If
this occurs, you must use the M terminal mode command to set the
new baud rate for your serial card. MODEM MGR does not respond
automatically to changes in baud rate initiated by the modem.

Many external modems in current use are "smart" modems. These
modems offer several features which are controlled by command
character strings received from the computer. MODEM MGR trans-
lates your terminal commands to the character strings recognized
by the modem. You may also control the modem directly by typing
the character strings on the keyboard. For example, one way you
can hangup a Hayes Smartmodem while on-line is to perform the
following:

1) Wait for one second
2) Type +++
3) Wait for one second
4) Type ATH [RETURN]

However, you can perform a hangup more easily by using the termi-

nal mode hangup command, which is [ESC] H. This command does essentially the four steps listed for you.

APPLE MODEM 300 OR 1200

This is a "smart" modem which provides the usual "smart" features. This modem uses a nine-pin DB-9 connector instead of a DB-25 connector. The pin assignments are listed below

Modem DB-9 Connector	DB-25 Connector 590-0121	DIN Connector 590-0192	Function
1			Not used
2	6	5	DSR modem output
3	7	3	Signal common (ground)
4			Not used
5	3	4	Modem signal output
6	20	1	DTR modem input
7	5,8		DCD carrier detect
8	1	shell	Chassis ground
9	2	2	Modem signal input

The DB-25 connector pins are shown for the Apple Part No. 590-0121 (][+ or //e) cable and the DIN connector pins are shown for the Apple Part No. 590-0192 (//c) cable when the cable is connected to the modem. If you are using a different cable, the pin assignments may be different.

The 590-0192 cable normally used with the //c does not handle the modem carrier-detect (DCD) signal. You cannot use carrier control with this cable unless you perform some cabling modifications. Chapter 11 describes an adapter you can use to provide the carrier detect signal with this cable.

The 590-0121 cable normally used with the][+ or //e provides the modem carrier-detect signal on two pins (5 and 8) of the DB-25 connector.

The pin 2 (DSR) output on the modem DB-9 connector is always "high" when the modem is powered on.

"HAYES-COMPATIBLE" MODEMS

There are dozens of "smart" modems which use the same command set as the Hayes Smartmodem. Although the degree of compatibility varies, most of these modems will work with MODEM MGR if the Hayes Smartmodem 300 or 1200 driver is selected in the INSTALL program. If your Hayes-compatible modem is not listed on the INSTALL program menu of external modem drivers, install the Hayes Smartmodem 300 or 1200 driver. Note there is a separate driver that must be used with the Hayes Smartmodem 2400.

HAYES SMARTMODEM 300 OR 1200

This is a "smart" modem which provides pulse or tone dialing, answer, hangup, automatic communications parameter selection, and many other features. This modem has established the "standard" character string commands used to control a "smart" modem. When a modem claims to be "Hayes-Smartmodem-compatible", it refers to the use of the same set of commands.

The modem carrier-detect output signal (DCD) is on pin 8 and the pin 5 (CTS) output is always "high" when the Hayes modem is powered on.

HAYES SMARTMODEM 2400

This is a "smart" modem which provides the same features as the Smartmodem 1200 except it also supports 2400 baud and some synchronous modes. This modem has no configuration switches. When you use this the modem for the first time, the active configuration profile is the factory-set profile. You can modify the active profile by entering configuration commands. You can permanently save the presently active configuration profile to the modem non-volatile memory by using the AT&W modem command. When you power the modem on and run MODEM MGR, the saved profile will become the present active configuration.

The modem carrier-detect output signal (DCD) is on pin 8 and the pin 5 (CTS) output is always "high" in the asynchronous mode.

With this modem, you cannot use the MODEM MGR terminal mode

command [ESC] T [RETURN] to switch from a telephone voice mode
to the originate modem communications mode. You may use the
answer command [ESC] A in the terminal mode to switch from the
voice mode to the answer mode. If you are talking to someone on
the telephone who is using a different modem, and you want to
switch to modem communications, direct the other party to enter
the originate mode while you enter the answer mode.

KANTRONICS UNIVERSAL TERMINAL UNIT

The Kantronics Universal Terminal Unit is a terminal unit (TU)
which interfaces a computer with a short-wave radio receiver.
This TU decodes and displays the received text from Morse code,
Baudot radio-teletype (RTTY), ASCII RTTY, and AMTOR. It
supports Morse code speeds of 6 to 99 words per minute, Baudot
RTTY speeds of 60, 67, 75, 100, and 132 words per minute, and
ASCII RTTY speeds of 110, 150, 200, and 300 baud.

This TU uses a "conventional" serial interface at 300 baud with
8 data bits, one stop bit, and no parity through a five-pin DIN
connector. Output data to the computer serial card is on pin 3
and input data from the computer serial card is on pin 1 of the
COMP connector. Pin 2 is signal ground (common). The pin num-
bering convention of this DIN connector is not the same as the
Apple convention. The pin numbering sequence on this connector
is 1-4-2-5-3.

If you have the appropriate radio license and a transmitter, you may
also use the TU and this software for transmitting. Since the TU
uses the escape character as a command lead-in character, you will
probably want to change the MODEM MGR command key from escape
to another control character. Use the INSTALL program to change
the command key.

Install the "non-smart" modem driver for this unit. The split-screen
video with keyboard block mode is recommended if you will be per-
forming transmit operations. This allows you to type in your next
transmission while receiving the incoming text. Since the TU has a
32-byte input buffer and the keyboard block mode can send up to
256 characters, you must prevent buffer overflow by enabling the
XON/XOFF option on the TU.

NOVATION SMART-CAT MODEM

This is a "smart" modem which supports pulse or tone dialing, answer, hangup, and many other features. The command prefix character is a percent (%) character. Do not re-program this character because MODEM MGR uses it as a command prefix when directing a modem operation. You may also enter commands directly to the modem by typing % followed by the command string.

The driver provided supports the current modem version which issues a CONNECT message when a connection is made. If you have the earlier version which issues a READY message instead, the W terminal command and unattended mode will not operate correctly if you have disabled carrier control. These functions will work properly if you have enabled carrier control. A modified driver for the earlier version is available.

The modem carrier-detect output signals (DCD) are on pins 5, 6, and 8.

Set the speed switch on this modem to match the default baud rate on your serial card. To change baud rates, you must type the %S n command to the modem, where n is the number (0, 1, or 2) corresponding to the new baud rate, then enter the [ESC] M terminal command to set the new baud rate for the serial card.

PROMETHEUS PROMODEM 1200

Do not confuse this external modem with the ProModem 1200A, which is discussed in the earlier section on internal plug-in modem cards. This is a "smart" modem which supports the usual "smart" features as well as some additional ones. In addition to the dialing commands supported by MODEM MGR, the 1200 modem also allows the following command characters in the dial string:

R   Switch to answer mode after dialing
W   Wait for second dial tone
;   Return to "smart" command mode after dialing

Although this modem has a built-in clock, its registers are not accessible directly through the computer card bus so MODEM MGR can-

not support continuous display of time-of-delay or elapsed time with this clock. However, you can set and read this clock using the AT@T commands as described in the modem manual.

The carrier-detect signal (DCD) is on pin 8. Pin 5 (CTS) is usually held "high". When a modem command is being executed pin 5 will go low momentarily.

TAPR TERMINAL NODE CONTROLLER TNC 1 OR 2

This terminal mode controller (TNC) provides an interface between the computer and a radio transmitter/receiver (transceiver). It formats the data into packets for transmitting, demodulates received packets, verifies the integrity of packets, manages the traffic flow, and controls the transceiver.

The TNC performs all of these functions with its built-in processor so your computer functions solely as a dumb terminal. The TNC interfaces with the terminal over a conventional serial interface. Pin 3 on the TNC DB-25 connector outputs data to the terminal and pin 2 inputs data from the terminal.

You can program several baud rates and combinations of word length, number of stop bits, and parity on the TNC. If you are using the split display with block keyboard mode at high baud rates, you may wish to set ECHO to OFF and SCREENL to 0.

US ROBOTICS COURIER 2400 MODEM

This modem supports the usual "smart" features as well as a baud rate of 2400 baud. In addition to the usual configuration switches, this modem has a reversal switch which transposes the functions of pins 2 and 3 on the DB-25 connector, if necessary. The carrier-detect output signal (DCD) is on pin 8 and the pin 5 (CTS) output is always "high" when the modem is powered on.

This modem will automatically switch baud rates from 2400 to 1200 baud if the other system being called operates at 1200 baud only. If this occurs, you must use the J terminal mode command to select the new baud rate for the serial card.

C H A P T E R   5

D R I V E R   I N S T A L L A T I O N

MODEM MGR operates with most of the popular peripheral cards
and modems used with the Apple // series computer. Before you
can run this program for the first time, you must install the drivers
associated with the peripheral cards and modem you are using.
There is an individual driver for each device you have and you can
install these drivers by running the INSTALL program. After you
perform the installation, you do not have to perform it again unless
you change cards or modems.

After installation, the drivers are permanently saved in the program
on the work disk. You will have a customized version of the pro-
gram which supports your hardware configuration. If any hardware
changes are made in the future, you can run the INSTALL program
again to re-configure the program.

The INSTALL program also allows you to set some of the program
defaults. If there are certain features you use most of the time,
you can configure the program so they are automatically enabled
whenever you start the program.

This chapter describes the INSTALL program and the steps you must
perform to install the proper drivers and set the desired defaults in-
to your program.

RUNNING THE INSTALL PROGRAM

Cold boot the install disk. This will automatically execute the
INSTALL program. You must do this on the computer you will be
using to run the installed MODEM MGR program. The INSTALL
program performs a partial automatic configuration based on the
computer you are using to run the INSTALL program, so do not run
it on a different computer. You may run the INSTALL program in
the 40- or 80-column video mode although the program will normally
boot into the 40-column mode. If you are using a //e or a //c or
if you are using an 80-column card in slot 3 of a][+, the INSTALL
program will assume you have lower case display capability.

UPPER/LOWER CASE

This paragraph does not apply if you have a //e or //c computer.
This paragraph applies to the 40-column display with a][+ computer.
When you first run the INSTALL program, you may see the query
"DO YOU HAVE 40-COLUMN LOWER CASE?". If you have lower-
case 40-column display capability with a lower-case chip or a key-
board enhancer, you should answer Y. If you do not have a lower-
case 40-column display device, answer N (for No). If you answer Y
to the query, the INSTALL program and the installed MODEM MGR
program will display lower case if you use the 40-column video. If
you answer N, you will see upper-case output with the INSTALL
program and also with the MODEM MGR program if you use 40-
column video. If you will be using an 80-column display with
MODEM MGR, your reply will not affect the 80-column display. If
you see a lot of punctuation characters in your 40-column display,
you may have answered Y and you do not have a lower-case 40-
column display.

LOAD MODEM PROGRAM

After you answer the question on lower case display (if it was
asked), the program will display an instruction for you to insert
the work disk with the uninstalled or previously-installed MDM0
(if DOS 3.3) or MDP0 (if PRODOS) program and press [RETURN].
If you are running the INSTALL program for the first time, you
have not installed any drivers yet, so your work disk has an unin-
stalled version of the MDM0 or MDP0 program. If you have already
run the INSTALL program one or more times before and have saved
the installed program on the work disk, you have a previously-
installed MDM0 or MDP0 program on the work disk.

Remove the install disk, insert the work disk into the same disk
drive, and press [RETURN]. A "Loading MDM0 (or MDP0) program"
message will appear while the program is being loaded. After it is
loaded, an "Insert INSTALL disk and press [RETURN]" message will
be displayed. Remove the work disk, insert the install disk into the
same disk drive, and press [RETURN]. If you have a //c computer,
you may see a "Loading //c drivers" message while the default print-
er and communications drivers are loaded.

MAIN INSTALLATION MENU

After the MODEM program has been loaded, the main installation
menu shown in figure 5-1 will be displayed.

You can always display this menu by pressing the [ESC] key. If
you have a //c computer, options 3 and 4 in figure 5-1 will not be
displayed on the menu.

You may quit and exit the INSTALL program by selecting option 0.
You will be asked to verify you wish to quit. Answer Y (for Yes)
or N (for No). If you wish to install the new program configuration,
you must use option 9 to save the newly installed program before
quitting.

You may use options 1 through 4 to install a video, modem, printer,
or clock driver. You can use option 5 to remove an installed printer
or clock driver. You may remove a video or modem driver by re-
placing it with another driver.

You can display the drivers currently installed by selecting option
6 on the main installation menu. If you select this option, the type
of computer (][+,][e, //e, or //c) will be shown along with any dri-
vers currently installed. If you loaded an uninstalled MDM0 or
MDP0 program, there will be no drivers listed unless you have a
//c computer. With the //c, the communications and printer driver
have been automatically installed.

You can use option 7 to set certain program defaults and you can
use option 8 to define keyboard translation so any control key you
type will output another specified character.

INSTALL VIDEO DRIVER

You must install a video driver in order to run the MODEM MGR
program. Select option 1 on the main installation menu. You will
see the current installed video driver displayed ("None" if no video
driver is installed) along with a list of several video drivers. If you
have a //c computer, there will only be two video drivers listed.
Enter the number corresponding to the video driver you desire. For
example, if you wish to use the internal 40 column video when

MAIN INSTALLATION MENU

0) Quit installation
1) Install video driver
2) Install modem driver
3) Install printer driver
4) Install clock driver
5) Remove driver
6) Show current drivers
7) Set defaults
8) Define keyboard translation
9) Save new installation

Enter (0-9) -->

Figure 5-1.   Main Installation Menu

MODEM MGR is run, enter number 1. If you don't want to enter
a choice, press the [ESC] key and you will return to the main instal-
lation menu.

NORMAL OR SPLIT SCREEN

After you have selected the video driver, you will be asked whether
you wish to have the normal or split screen. The normal video dri-
ver displays all of the received communications text starting from
the top line down to the bottom line of the video display. After the
bottom line is written on the screen, the screen will scroll upward
and subsequent text lines will appear on the bottom line. If you are
using a 24 line video screen, all 24 lines will be used to display the
received communications text.

The split-screen presentation will divide the display into two
screens. The upper screen will consist of 19 lines and will display
the received communications text starting from the top line down to
the 19th line. After the 19th line is written on the screen, the upper
19 lines will scroll upward and subsequent text will appear on the
19th line. The 20th line will be a dashed line to divide the two
screen areas. The lower screen will consist of the last four lines at
the bottom of your video display. All transmitted text keyed on
your keyboard will be displayed in the lower screen. As you enter
lines of text from your keyboard, it will be displayed starting from
the 21st line down to the 24th line. After the 24th line has been
written, the four lines will scroll upward and subsequent keyed text
will appear on the 24th line.

Enter N (for Normal) or S (for Split). Initially you should select
the normal screen display. Later, after you become familiar with the
program, you may wish to try the split-screen mode.

After you make the N or S selection, you may be asked which slot
the video card is in. This question will not appear if you have
specified an Apple 40-column or an Apple //e or //c 80-column
driver, since these video devices are not plugged into the expansion
slots. If asked, enter the slot (1 through 7) the video card is in.

Some video cards can be operated in any expansion slot from 1
through 7. This is usually dictated by the video card firmware.

Some firmware versions require slot 3 for the video card. Although the video driver does not use the firmware routines for display, it does use the firmware initialization routine. If the video card is slot independent, you may install the card in any slot. However, if the card must always be in slot 3, then be sure the card is in that slot.

After the slot is entered (if asked) the video driver will load from the install disk.

If you have a][+ computer with lower case capability, you will be asked which of the following methods you are using for upper/lower case shifting:

1) None
2) Single-wire shift mod
3) Control-A
4) Videx keyboard enhancer

The single-wire shift mod is the usual modification where a wire connects pin 24 on the keyboard encoder card to pin 4 of the game I/O connector. Control-A refers to the use of [CTRL] A to toggle between upper and lower case. If this method is used, Control-A cannot be used for any other function (including the editor word-left command). You may change this to another control character by using the default setting feature of this INSTALL program. This will be discussed later. The Videx keyboard enhancer provides normal shifting with the keyboard [SHIFT] key.

If you have a Videx Ultraterm card and you specified the normal video mode, you will be asked which default video format and display attribute you want.

Finally, the video driver and slot number (if any) you have selected will be listed on the screen and the message "Use this driver?" will be displayed. If you answer Y (for Yes), this video driver will be installed. If you answer N (for No), this driver will not be installed and the previous video driver (if any) will remain installed.

If you answer Y, all of the currently installed drivers will be displayed. Inspect the display and verify the video driver you just installed is there.

If your video card was not listed on the video driver menu, then it is not supported by this program. So-called "compatible" video cards will not work. This program supports only the expansion slot video cards which can be written and scrolled fast enough to handle ordinary text at 19200 baud continuously.

INSTALL MODEM DRIVER

You should also install a modem driver in order to run the MODEM MGR program. Enter option 2 on the main installation menu. You will see the current installed modem or serial/communications card displayed. ("None" if no driver is installed). If you are using a //c computer, the serial driver has automatically been installed by the program, so skip over to the section on INSTALL EXTERNAL MODEM.

If you are not using a //c computer, you will have a choice of installing an internal plug-in modem or an internal plug-in serial/communications card with an external modem.

Enter 1 if you are installing an internal plug-in modem. Enter 2 if you are installing an internal serial or communications card with an external modem and skip to the section on INSTALL INTERNAL SERIAL/COMM CARD.

INSTALL INTERNAL PLUG-IN MODEM

If you enter 1 to install an internal plug-in modem, you will see a list of internal modems. Study the list and determine if your modem is on the list. Select the number corresponding to your modem. If your modem is not on the list, select one which is compatible with yours. If your plug-in modem is "Hayes-Micromodem compatible", try the Hayes Micromodem II driver. If your modem also supports tone dialing, try the Hayes Micromodem IIe driver.

There are three drivers available for the Novation Apple-CAT modem. The 300 baud driver supports 50, 75, 110, 150, and 300 baud.

If you don't have the 212 upgrade card, we recommend this driver.
If you have the 212 upgrade card, we recommend the 300/1200 baud
driver. This supports both 300 and Bell 212 1200 baud. The third
Apple-CAT driver supports the Bell 202 1200 baud half-duplex mode.
You probably will not use this driver unless you know someone else
who is using a compatible 202 system.

After you select an internal plug-in modem driver, it will load from
disk. After the driver is loaded, the driver selected will be displayed
on the screen and you will be asked whether you wish to use this dri-
ver or not. If you answer Y (for Yes), this driver will be installed.
If you answer N (for No), this driver will not be installed and the
previous modem driver (if any) will remain installed.

If you answer Y, all of the currently installed drivers will be
displayed. Inspect the list and verify the driver you just installed
is listed. Skip over to the section in this Chapter on INSTALL
PRINTER CARD.

INSTALL INTERNAL SERIAL/COMM CARD

If you enter 2 on the modem driver sub-menu to install an internal
serial or communicatons card with an external modem, a list of
internal serial/comm cards will be displayed. Study the list and
determine if your serial card is on the list. Select the number cor-
responding to your card. If your serial card is not on the list, select
one which is compatible with yours. If your serial card is "Apple
Communications Card compatible", try the Apple Communications
driver. If your serial card is "Apple Super Serial Card compatible",
try the Street Alphabits driver. (The Super Serial Card driver reads
the dip switches which your "compatible" card might not have).

After you select the serial/comm card driver, you will be asked to
enter the card slot number. Read the query carefully. In most
cases, you must enter the physical slot the card is in. In some (but
not all) multi-function cards, you must enter the phantom slot the
serial function is mapped to. If the query is "Which slot is card in?",
enter the actual physical slot number the card is plugged in and if
the query is "Which mapped slot no?", enter the phantom slot number.

After you enter the slot number, the serial/comm card driver will
load from the install disk.

Next, the serial/comm card video driver and slot number you have
selected will be displayed on the screen and you will be asked
whether you wish to use this driver or not. If you answer Y (for
Yes), this driver will be installed. If you answer N (for No), this
driver will not be installed and the previous driver (if any) will re-
main installed.

INSTALL EXTERNAL MODEM

You will now see a list of external modems. Study the list and de-
termine if your modem is on the list. Select the number correspon-
ding to your modem. If your modem is not on the list, select one
which is compatible with yours. If your modem is "Hayes Smart-
modem compatible", try the Hayes Smartmodem driver.

If you are using a packet radio terminal mode controller or a radio
interface unit, select the non-smart modem driver.

After you select the driver, it will load from the install disk.

Finally, the external modem driver you have selected will be dis-
played on the screen and you will be asked whether you wish to use
this driver or not. If you answer Y (for Yes), this modem driver
will be installed. If you answer N (for No), this driver will not be
installed and the previous driver (if any) will remain installed.

If you answer Y, all of the currently installed drivers will be dis-
played. Inspect the list and verify the driver or drivers you just
installed are listed.

INSTALL PRINTER CARD

Read Chapter 12 on printers before installing the printer driver.
You do not have to install a printer driver for two-way commu-
nications with MODEM MGR. Therefore, you may wish to defer
installation of a printer driver until you have read Chapter 12.

If you enter 3 to install a printer card, you will be asked whether you wish to install a parallel or serial printer driver. Enter 1 for a parallel printer or enter 2 for a serial printer. A list of printer cards or multi-function cards having a parallel printer or serial output will then be displayed. Study the list and determine if your printer card is on the list. Select the number corresponding to your card.

If you have a parallel printer card, inspect the list of parallel printer cards and select the number corresponding to your card. Multifunction cards having both serial and parallel functions will have a (P) shown to indicate the parallel function. There are many cards which fall into the category of "Typical Parallel" card. These include the Apple Parallel Printer Interface, Apple Parallel Interface, Epson Apple II Parallel Interface Kit, Microtek RV-611C, Practical Peripherals GraphiCard, Wizard Intelligent Printer Interface, and many others. If your parallel card does not appear on the menu, try the "Typical Parallel" driver.

If you have a serial printer card, inspect the list of serial printer cards and select the number corresponding to your card. Multifunction cards having both serial and parallel functions will have a (S) shown to indicate the serial function.

After you select the printer driver, you will be asked to enter the card slot number. Read the query carefully. In most cases, you must enter the physical slot the card is in. In some (but not all) multifunction cards, you must enter the phantom slot the printer function is mapped to. If the query is "Which slot is card in?", enter the actual physical slot number the card is plugged in and if the query is "Which mapped slot no?", enter the phantom slot number.

After you enter the slot number, the printer card driver will load from the install disk.

If you are using ProDOS and are installing a serial printer card, you will be prompted to insert the ProDOS utility disk. The ProDOS serial printer drivers are on that disk. After the serial printer driver is loaded, you will be prompted to insert the install disk again.

Next, the printer card driver and slot number you have selected
will be displayed on the screen and you will be asked whether you
wish to use this driver or not. If you answer Y (for Yes), this
printer driver will be installed. If you answer N (for No), this
driver will not be installed and the previous driver (if any) will
remain installed.

INSTALL CLOCK CARD

If you enter 4 to install a clock card, you will see a list of clock
cards or multi-function cards having a clock feature. Study the list
and determine if your clock card is on the list. Select the number
corresponding to your card. Some manufacturers have several ver-
sions of clock cards, so be sure the version selected has exactly
the same name as your card.

MODEM MGR does not support any other clock cards (even the ones
claiming to be compatible) except those shown on the menu. How-
ever, you might try the following if your card is not listed on the
menu. Inspect the card or the card schematic to determine which
type of clock device is used. If it is a 5832 device, try the AST
Multi I/O clock driver and if that doesn't work, try the Practical
Peripherals Proclock driver. If it is a 1990 device, try the Thunder-
ware Thunderclock Plus driver.

MODEM MGR does not set the time. Each clock card is provided
with a program listing or a utility program on disk to perform that
function. The time can be set in the 12-hour or 24-hour format,
except the CCS 7424 clock driver, which must be set in the 24-hour
format. MODEM MGR will always display the time in the 12-hour
format. If your clock card has a write-protect switch, set it after
the time has been set.

MODEM MGR will not support elapsed time with the Mountain
Hardware Apple Clock. Time-of-day is the only clock feature sup-
ported with this card.

After selecting the clock driver, you will be asked to enter the card
slot number. Read the query carefully. In most cases, you must
enter the physical slot the card is in. In some (but not all) multi-
function cards, you must enter the phantom slot the clock function

is mapped to. If the query is "Which slot is card in?", enter the actual physical slot number the card is plugged in and if the query is "Which mapped slot no?", enter the phantom slot number.

After you have entered the slot number, the clock card driver will load from the install disk.

Next, the clock card driver and slot number you have selected will be displayed on the screen and you will be asked whether you wish to use this driver or not. If you answer Y (for Yes), this clock driver will be installed. If you answer N (for No), this driver will not be installed and the previous clock driver (if any) will remain installed.

If you install a clock card and the corresponding driver and later remove that card from the computer, be sure to use option 5 on the main installation menu to remove the existing clock driver. MODEM MGR will halt if you remove the clock card or move it to another slot without re-running the INSTALL program to update the clock driver.

SET DEFAULTS

When MODEM MGR is started, some features are initially disabled until you use the command to enable it. For example, the capture buffer is off until you enter the B terminal command to turn it on. If you wish to have a feature initially enabled or disabled when MODEM MGR is run, you may set the default by selecting option 7 on the main installation menu. You can also define some operational defaults which can not be changed while the program is running.

Some communications and printer defaults are reset when the associated driver is loaded so set the default **after** you load the driver.

When you select option 7, a menu of defaults will be displayed. Actually there are two menus which you can toggle between by pressing the [0] key. Defaults 1) through 15) are on the first menu and defaults 16) through 34) are on the second menu. If you want to set or change a default, the menu which lists that default must be currently displayed on the screen.

Defaults 1) through 15) have two possible states. In most cases, the two states are ON and OFF, although other states are used for some defaults. If you want to toggle the present state to the opposite state, enter the menu number corresponding to the default. After you toggle the state, the menu will be re-displayed with the new state shown. For example, if the first line in the SET DEFAULTS menu shows "1) Capture: OFF", you can toggle the capture from OFF to ON, by typing 1 followed by [RETURN]. After doing this, verify the same line now reads "1) Capture: ON". To toggle it OFF, type 1 followed by [RETURN] again.

The following is a brief description of defaults 1) through 15).

1) Capture - This default sets the initial state of the capture buffer to on or off.

2) Auto save - This default sets the initial state of the auto save feature which automatically saves the buffer to disk when the buffer is full.

3) Duplex - This sets the initial mode to full or half duplex.

4) Send modem LF - This sets the initial state to either insert a LF character automatically after each CR character sent or not insert a LF character.

5) Modem XON/XOFF - This initially enables or disables the XON/XOFF control.

6) Menus - If this default is set off, the main menu and the "Enter -->" prompt in the terminal mode will be not be auto- matically displayed. If set on, all menus and prompts will be displayed.

7) Block mode - If set on, the initial keyboard mode when the split-screen video driver is used will be the block mode. If set off, the initial state will be the normal keyboard mode.

8) Capture nulls - If set on, all null (hex 00) characters will be captured in the buffer. If set off, nulls will not be captured except those associated with a video lead-in function.

9) Clock - This default will set the initial state of the clock display to ON or OFF.

10) Clock display - This default will select either the time-of-day or elapsed-time display as the initial clock display mode.

11) Emulation - This default will set the initial state of emulation to ON or OFF.

12) Carrier control - This default will set carrier control to ON (enabled) or OFF (disabled). If enabled, the carrier-detect signal from the modem must be properly interfaced to your computer. Carrier control is discussed in chapter 11.

Defaults 13) through 15) are discussed in Chapter 12 on printers.

13) Printer
14) Send printer LF
15) Set printer bit 7

Defaults 16) through 33) have a numerical value associated with each default. The present value will be displayed in hexadecimal and can be changed by entering the menu number corresponding to the default followed by [RETURN], followed by the new hexadecimal value and [RETURN]. For example, if the default menu shows "20) Shift key: $01", the present shift key is control-A (hex $01). You can change this to control-Z (hex $1A) by entering 20 and [RETURN] followed by 1A and [RETURN]. After you do this, verify the menu now shows "20) Shift key: $1A".

The following is a brief description of defaults 16) through 34).

16) Command key - This default value defines the command key which you must type in the terminal mode to enter the terminal command mode. This program normally uses the [ESC] key, which is hex $1B. You can change it to any other key by changing the $1B to the hexadecimal ascii number corresponding to the key. This does not affect the command key used in the editor, unattended and transfer modes; the [ESC] key is still used in those modes.

17) Macro time-out - This default defines the length of time before

a macro L or R command is terminated because a match with the specified string was not received. The larger the value is, the longer the time-out. Usually this value is $0F.

18) Comm XON - This default defines the character which will be sent to the other system to signal it to resume sending after an XOFF was previously sent. Usually this value is $11. Do not enter a value greater than $7F.

19) Comm XOFF - This default defines the character which will be sent to the other system to signal it to stop sending. Usually this value is $13. Do not enter a value greater than $7F.

20) Shift key - This default defines the control character which will be used for upper-case shifting with a][+ computer. The appropriate shift method must also be specified when the video driver is installed.

21) Snapshot key - This default defines the control key which will save the video screen text to the capture buffer. This program normally uses the [CTRL] V key (hex $16).

22) Comm command byte - This default defines the command byte which will be used to initialize the serial or communications card. If this is set to $00, the program will initialize the card using its default parameters. If a Type 2651 serial card is used, the mode register 1 byte can be defined here. This byte is initialized to 00 when a new serial or communications card driver is installed.

23) Comm control byte - This default defines the byte which will be used to initialize the control byte for a Type 6551 serial card, the mode register 2 byte for a Type 2651 serial card, or the baud rate for a Type 8251 card. If the comm command byte (see above) is set to $00, this byte will be ignored and the program will initialize the card using its default parameters. This byte is initialized to 00 when a new serial or communications card driver is installed.

Defaults 24) through 33) are discussed in chapter 12 on printers.

24) Printer command byte
25) Printer control byte

26) Printer nulls
27) Printer columns
28) Printer lines
29) Printer XON
30) Printer XOFF
31) Printer handshake mask
32) Printer form feed
33) Imbedded print cntl char

34) Default phone no. - This defines the default telephone number which can be dialed with the [ESC] T D command in the terminal mode. Any number, upper-case letter, or punctuation character can be entered. A maximum of 32 characters can be entered.

DEFINE KEYBOARD TRANSLATION

Keyboard translation allows you to re-define any control key on the keyboard to another character. When you type the control key, the re-defined character is sent. This allows the][+ computer to output characters not available on its keyboard. It also allows some re-mapping of the control keys if desired. To redefine a single key to output a string of characters, see the section in Chapter 8 on function keys which allows the number (0-9) keys to be used to output character strings.

When option 8 on the main installation menu is selected, the menu shown in Figure 5-2 will be displayed.

If you select 1) on the keyboard translation menu, the current translated keys (if any) are shown in the following format:

$aa --> $bb

aa represents the hexadecimal ascii value of the control key and bb represents the hexadecimal ascii value of the character that the key has been redefined to. For example, the following display:

$08 --> $7F

This means the control-H or backspace (hex $08) key has been redefined to output a DELETE character.

DEFINE KEYBOARD TRANSLATION

1) Show current values
2) Change or remove value
3) Remove all values

[ESC] to exit

Enter (1-3) -->

Figure 5-2. Keyboard Translation Menu

If you select 2) on the keyboard translation menu, you may enter a
control key to be redefined or to be restored to the normal untrans-
lated state. Enter the control key ascii value in hexadecimal. This
value must be in the range of $00 to $1A. If this control key has
already been redefined, the present translated ascii value will be
displayed. You may enter a new value or enter [RETURN] to re-
move the current translation.

You can remove all of the control key translations by selecting 3 on
the keyboard translation menu.

If a control key is used for upper/lower case shifting, that key will
not be translated, even if it has been redefined.

When you use the editor, the keyboard translations will be tempo-
rarily inhibited.

SAVE NEW INSTALLATION

The last step in incorporating a new installation is to save it to the
work disk. You can save the modified MDM0 (if DOS 3.3) or MDP0
(if PRODOS) program by selecting option 9 on the main installation
menu. If you do not do this before quitting, the new installed dri-

vers and defaults will not be incorporated into the MODEM MGR
program. After this is done, you may boot the work disk to start
the program.

STARTUP PROBLEMS

If you have startup problems, turn the computer power off and then
on again to force a cold boot. As the work disk boots and loads the
programs, compare the results you observe on your system with the
corresponding steps in the following description of a normal cold-
boot startup.

1) The operating system will load in approximately 4 to 5 seconds
after which you will see either the "]" Applesoft prompt (DOS 3.3)
or the ProDOS title page on the 40-column video screen. If you
have a video switch you will not see this if the switch is not in the
40-column mode. If the operating system does not load, you may
have a bad work disk.

2) After a few seconds, the ProDOS version will show the message
"LOADING MODEM MGR". With DOS 3.3 or ProDOS, the MODEM
MGR program will load in approximately 11 to 14 seconds. If this
does not occur, you have a bad work disk.

3) If your video device will switch under software control, the in-
stalled video format will switch in and the video screen will clear.
The program version and type of computer and hardware cards in-
stalled will be displayed. If the wrong video driver was installed or
installed for the wrong slot, the display will not appear. If a dif-
ferent type (][+,][e, //e, or //c) of computer was used for installa-
tion, the program will quit.

4) The program will pause while the modem is being initialized. A
"smart" modem may take as long as 15 seconds to initialize. If your
serial card transmitter control input is not "high", the program may
hang here. If you have not installed the correct modem or serial/
communications card, or specified the wrong slot number for this
card, the program may hang also.

5) The default emulation, function key, and macro files will be
loaded if present on disk. If they are not present, they will not

be loaded. Delete any "BTMAC.FILE" file from the work disk to prevent startup execution of a macro while trying to trace the source of a loading problem.

6) The terminal program will load in approximately 2 to 3 seconds. If this does not occur, you may have moved one of the "MDM#" (DOS 3.3) or "MDP#" (ProDOS) files on the work disk or you may have a bad disk.

7) The terminal mode menu will appear. If you have installed the wrong clock driver, or the wrong slot for the clock card, the program may hang before the menu appears.

TROUBLE-SHOOTING

If the program does not boot properly, go through the following installation steps in sequence to determine the problem. If the program does not run after a card has been installed, either that card or the installation of that card is the cause of the problem. If you have a //c, just perform the steps marked with *. Use new copies of the work and install disks.

1) Turn off the computer and remove all cards in the expansion and auxiliary slots except the 5-1/4 inch floppy disk controller card in slot 6. It is important to start with an "empty" card environment. If you are using ProDOS with a][+, install your memory card in expansion slot 0.

*2) Run the INSTALL program and install the 40-column (non-split) video driver.

*3) Verify no other drivers (modem, printer, or clock) are installed.

*4) Boot the program and verify the program runs.

*5) If it runs, turn the computer off, plug in your video card (if any) and install the normal (non-split) driver for that video card with the INSTALL program. For a //c, install the 80-column (non-split) driver.

*6) Boot the program and verify the program runs.

7) If it runs, turn the computer off. If you are using DOS 3.3 on a][+ and have a 16K RAM card, plug it into slot 0.

8) Boot the program and verify the program runs.

9) If it runs, turn the computer off, plug in your modem or serial card and install it with the INSTALL program.

10) Boot the program and verify the program runs.

11) If it runs, turn the computer off, plug in your printer card (if any) and install that driver with the INSTALL program.

12) Boot the program and verify the program runs.

13) If it runs, turn the computer off, plug in your clock card (if any) and install that driver with the INSTALL program.

14) Boot the program and verify the program runs.

15) If it runs, turn the computer off, plug in the remaining cards you use one at a time and boot the program after each card is plugged in. Verify the program runs each time.

If the program fails to run after a particular card has been inserted, that card is faulty or not compatible with one of the other cards.

CHAPTER 6

TERMINAL MODE

After you have performed the installation procedure, you will have
a DOS 3.3 or ProDOS work disk configured for your system. Your
work disk should have the following files on it:

DOS 3.3	ProDOS
-----------	-----------
HELLO	PRODOS
MDM0	MMGR.SYSTEM
MDM1	MDP0
MDM2	MDP1
MDM3	MDP2
MDM4	MDP3
	MDP4

There are probably many other additional files on your work disk,
but these listed files are the minimum required.

When you boot your work disk, the MMGR.SYSTEM (ProDOS) or
HELLO (DOS 3.3) program will automatically run. This will load
some of the other programs and perform initialization. After the
initialization is completed, the terminal program will load and exe-
cute. The terminal mode allows you to communicate with other sys-
tems. If you are online with another system, any text received will
be displayed on your video screen and any character keys you type
on the keyboard will result in the transmission of those characters
to the other system.

When you enter the terminal mode for the first time, you probably
have not yet established contact with another system. There are
several terminal commands which will allow you to make a connec-
tion. To enter a command, you must be in the terminal **command**
mode. Press the [ESC] key to enter the terminal command mode
and you will see the following prompt:

        Command?-->

MISCELLANEOUS   BUFFER
-------------------------- ------------
D:Disk functions   A:Auto save
E:Emulation ON/OFF   B:Buffer ON/OFF
I:Insert auto LF   C:Clear
K:Klock ON/OFF   R:Restore
L:Look at status   S:Space
N:New emulation   V:View
P:Printer ON/OFF
Q:Quit   MODEM/PHONE
U:Unattended   -----------------------
Y:File transfer   F:Full/half duplex
Z:Editor   G:Get Number/Help
@:Exec macro   H:Hangup
0:Load funct keys   J:Parity/length
1-9:Function keys   M:Modem baud rate
<:Time/timer   O:Orig to answer
;:Reset timer   T:Telephone dial
^:Send break   W:Wait for call
^V:Snapshot   X:XON/XOFF

Figure 6-1. Terminal Command Menu

If you want to exit the terminal command mode and return to the terminal mode, just enter a [RETURN] and you will be back in the terminal mode ready to receive and send text.

If you enter [ESC] to enter the terminal command mode (remember the "Command?-->" prompt will appear) and enter a question mark (?) as a command, you will see the menu shown in figure 6-1. This menu lists all of the commands available in the terminal command mode (except the ? command). If you are using the split video mode, the menu will have a slightly different format.

TERMINAL COMMANDS

You may enter a terminal command by typing a single letter, number, or punctuation character after the "Command?-->" prompt appears. You do not have to press the [RETURN] key after the command key is typed. For example, type the ? command to display the terminal command menu. After the menu is displayed, the program will return to the terminal mode. Most commands will return to the terminal mode after the command has been executed. Some commands will lead to secondary command modes where you can enter additional commands.

You may enter most command sequences as fast as you can type them on the keyboard. For example, suppose you are in the terminal mode and you want to see the disk catalog. Enter [ESC] for the command prompt, enter D for the disk menu, then enter C to display the disk catalog. When you are in the terminal mode again, enter the same commands, except type the sequence [ESC] D C as fast as you can. (Don't type the spaces which are included for clarity.) You will see the disk catalog again with the disk menu appearing only briefly. When you become familiar with the commands in this program you do not have to wait for the menus. The menus are there if you need them, but they will not slow you down.

The above example showed the command letters D (for disk function) and C (for catalog). We have attempted to use meaningful command letters wherever possible. However, with a large number of terminal and secondary commands, this was not possible in all cases.

Some terminal commands will execute quickly, while some commands
will take longer. When a quick command is executed, the input buf-
fer provided in this program will prevent loss of any text characters
received while the command is being executed. The A, B, C, I, K,
L, P, R, S, X, <, ;, and ^V commands will execute without losing any
received characters.

Commands which involve a disk operation or a special communica-
tion or modem operation (baud rate, word length, parity, duplex,
dialing, send break, etc.) will cause loss of any characters received
while the command is being executed.

If the other system responds to XON/XOFF, you can manually type
the XOFF character (usually control-S) to signal the other system to
stop sending before you use a disk command. After the disk opera-
tion, you can manually type the XON character (usually control-Q)
to signal the other system to resume sending. However, an easier
way is to let this program do it for you. If you have enabled
XON/XOFF (by using the X command), this program will automa-
tically send XOFF when the D (Disk functions) or V (View buffer)
command is executed and will automatically send XON when the
command is completed.

If you accidentally enter an unintentional command and become lost
in a secondary mode, enter [ESC] or [RETURN] until you are back
in the terminal mode.

Some commands are toggle commands. When you enter a toggle com-
mand, you switch something that is on to off or you switch something
that is off to on. For example, if your capture buffer is off and you
enter [ESC] B, you will turn the buffer on. If you enter [ESC] B
again, you will turn the buffer off.

When most commands are executed, a message will be displayed to
show what the command has accomplished. Although these status
messages are displayed along with the received text on your video
screen, these messages will not be captured in the buffer.

When you are in the terminal mode, you can also control a "smart"
modem by sending it a text string in the command format recognized
by the modem. For example, the hangup command for some "smart"

modems requires a one-second pause followed by "+++", another one-second pause followed by "ATH", and a [RETURN]. However, it is simpler for you to use the [ESC] H command to hangup when you are in the terminal mode.

We recommend you use the terminal commands provided by this program instead of typing "smart" commands directly from your keyboard to the modem. You may type "smart" commands directly to the modem to turn the speaker off, run modem tests, or view a modem menu, but do not change the modem command or status formats since this program relies on those formats. This program will support a "smart" modem only if the modem remains in the default state set by this program.

You can store many of the MODEM MGR commands in a pro-grammed sequence in a text file. All of the commands in the file can then be executed without any further intervention on your part whenever you want to. The programming and use of these macro script files are described in Chapter 8.

The default command key is the [ESC] key. This is the key you must type to enter the terminal command mode. If you wish to transmit the escape character to the other system, press this key twice. You may change to another control key instead of the [ESC] key by specifying a new command key when you run the INSTALL program.

A description of each terminal command follows. You do not have to learn all of these commands in order to use this program. Initial-ly you should skip through the following paragraphs and just read the descriptions of those commands that interest you. Later you should review all of the commands to familiarize yourself with the capabilities of this program.

A:AUTO-SAVE BUFFER

This command applies when the capture buffer has been set on (enabled). This auto-save command toggles the auto-save feature. If auto-save is on, this program will automatically save the contents of the capture buffer to a disk file when the buffer is nearly full with received text. The buffer will be saved to a file named

SAVED.A on the currently logged disk. Subsequent auto-saves will
be to files named SAVED.B, SAVED.C, and so on. After the buffer
is saved to disk, the buffer will be cleared and will remain on so
additional received text can be captured and saved.

If auto-save is off, this program will not save a full buffer auto-
matically to disk. Instead, a "SAVE? (Y/N) -->" message will be
displayed and you will have the option of saving or not saving the
buffer to disk. If you decide to save the buffer to a disk file, the
filename or pathname of the file will be requested. After you
furnish the name, the file will be saved, the buffer will be cleared,
and the buffer will remain on. If you decide not to save the buffer
to a disk file, the buffer will not be cleared, but will be turned off
since it cannot capture any more characters in its full state.

If the other system sending to you responds to XON and XOFF, you
can save several buffer loads automatically without losing any re-
ceived characters. Enable XON/XOFF (X command) and set auto-
save to on. When the buffer has room left for only 512 more char-
acters, a "BUFFER ALMOST FULL" message will be displayed. This
program will then send XOFF to the other system to direct it to
stop transmitting. The other system may send a few more text char-
acters before stopping. (A "BUFFER FULL" message will be dis-
played if the buffer becomes full). Since auto-save is on, the buffer
will be saved to disk, cleared, and left in the on state. Finally, this
program will send XON to the other system to direct it to resume
sending again. This will be repeated as often as necessary without
requiring any action on your part until the disk is full and can no
longer save any more text.

You will see several status messages appearing on the screen along
with the received text whenever this stop/save/go sequence occurs.
Although the status messages will be interspersed with the received
text, all of the received characters will be displayed and saved in
the capture buffer and none of the status messages will be saved in
the buffer.

If the other system does not recognize XON/XOFF and continues to
transmit until your buffer is full, any subsequent received charac-
ters will not be saved in your buffer until you clear or save the
buffer and enable it again.

B:BUFFER ON/OFF

This command toggles the capture buffer on or off. When the capture buffer is toggled on, received characters will be saved in the buffer. When the buffer is toggled off, received characters will not be saved.

If the buffer already contains characters when it is toggled on, any new characters received will be saved starting at the end of the current buffer contents.

You do not have to turn the capture buffer on to load text from a disk file into the buffer or to capture the screen to the buffer using the snapshot (^V) command.

C:CLEAR BUFFER

This command clears (erases) the contents of the capture buffer. If you accidentally use this command and don't want to clear the buffer, you can restore the original contents of the buffer if you use the restore buffer (R) command immediately.

D:DISK FUNCTIONS

This command allows you to perform common disk operations. When you enter this command, a disk functions menu similar to that shown in figure 6-2a or 6-2b will be displayed. In the DOS 3.3 version, the slot and drive number of the currently logged disk drive will be displayed as well as the disk volume (in hexadecimal) in that drive. In the ProDOS version, the current volume prefix will be displayed instead.

If you have XON/XOFF enabled, XOFF will be sent to signal the other system to temporarily halt sending. This is done because text cannot be received while a disk operation is being performed. After most disk functions are completed, the program will return to the terminal mode and XON will be transmitted automatically to signal the other system to resume sending again.

You may execute the following secondary commands in this disk functions mode.

DISK FUNCTIONS

Slot=6
Drive=1
Volume=FE

C:Catalog
R:Read TXT file
W:Write TXT file
E:Erase file
S:Slot
D:Drive
L:Load BIN file
B:BIN file write

Disk command -->

Figure 6-2a
DOS 3.3 Disk Functions Menu

DISK FUNCTIONS

Prefix=/MMGR/

C:Catalog
R:Read TXT file
W:Write TXT file
E:Erase file
P:Prefix
S:Slot
D:Drive
L:Load BIN file
B:BIN file write

Disk command -->

Figure 6-2b
ProDOS Disk Functions Menu

C:Catalog. This secondary disk function command will display
the catalog of the currently active disk drive or volume. If a long
catalog is being displayed, the listing will stop near the bottom
of the screen. Enter a [SPACE] to continue the listing or enter a
[RETURN] to terminate the catalog operation. After the catalog
is listed, the program will return to the terminal mode.

If you want to catalog another drive, you may enter the new drive
number quickly after entering the C command. For example, if you
are in the terminal mode and drive 1 is active and you wish to see
the catalog for drive 2, enter [ESC] D C 2. If you do not type the
2 quickly enough, you will see the catalog for the old active drive
(drive 1). Whenever you use this technique, the drive specified will
also become the new active drive or prefix.

R:Read text file. This secondary disk function command will allow
you to read the contents of a disk text file and display it on the vid-
eo screen or store it directly in the capture buffer. If you decide
not to read a file, just enter [RETURN] when you are asked to sup-
ply a file name or destination.

When you enter this command, you will be asked if you want to
read the file to the buffer or the screen. Enter B (for buffer) or
S (for screen). You will then be asked to enter the filename or
pathname of the text file. After you enter the name, the text
file will be read.

This paragraph applies if you are reading a disk text file to the
buffer. If there are characters already in the buffer, the char-
acters read from the disk file will be stored starting at the end
of the current buffer contents. Any CR characters in the disk
file will be stored in the buffer as a CR/LF combination. If the
buffer becomes full while a text file is being loaded, a "BUFFER
FULL" message will be displayed and the remainder of the disk
file will not be read.

This paragraph applies if you are reading a disk text file to the
screen. You may use the [SPACE] key as a pause key to tempo-
rarily stop the read operation and you can use any key except the
[RETURN] key to resume the read operation. If you depress the

[RETURN] key, the read operation will be terminated. You can
also enter a control-X or control-C to display all control characters
(except control-J, and control-M) as a "^" character followed by the
associated letter character. For example, control-A will be displayed
as ^A. The control character display will be cancelled when you
press the [SPACE] key and can be re-enabled by entering control-X
or control-C again.

If terminal emulation is off, all control characters in the disk file
are ignored by the video device except the following:

> Control-G   Bell
> Control-H   Backspace
> Control-J   LF
> Control-M   CR

If terminal emulation is on, any control characters in the disk file
will result in video display operations defined by the currently
loaded emulation file.

If you have specified an imbedded print control character in the
INSTALL program and your printer is toggled on, any appearance
of that character in the disk file will toggle your printer on or off.
You can use this feature to print designated portions of the disk
file. This can also confuse you if you are printing while reading a
disk file and you are unaware of the presence of the print control
character. This feature is described in more detail in Chapter 12.

W:Write text file. This secondary disk function command will write
your buffer contents to a disk text file. If your buffer is empty,
a "BUFFER EMPTY" message will be displayed and this command
will be cancelled. The filename or pathname for the disk file will
be requested. If you specify an existing name, the existing file
will be replaced with the new file. After you enter the name, your
buffer contents will be saved to disk and your buffer will be cleared
(erased) automatically. If you want to restore your buffer contents,
enter the R (restore buffer) command immediately.

The text will be saved as a conventional text file which is compa-

tible with most other programs which use text files. All CR/LF combinations and single LF characters in the buffer will be converted to single CR characters in the disk file. DOS 3.3 files will have bit 7 of all characters set and the end-of-file marker will be a 00. ProDOS files will have bit 7 of all characters cleared and the end-of-file offset (file length) will be stored in the file directory. Although many ProDOS text files have 00's filling the unused portion of the last file disk block, a 00 does not indicate the end of a ProDOS text file. All control characters (except LF) will be saved to disk, including 00.

E:Erase disk file. This secondary disk function command will erase a disk file. After you enter this command, the filename or pathname will be requested. If you don't want to erase a file, just enter [RETURN]. After you enter the name, the file will be erased. If the file is locked, a "FILE LOCKED" message will be displayed and you will be asked if you want the file to be unlocked and erased. Enter Y (for Yes) if you wish to unlock and erase the file or enter N (for No) if you don't want to unlock and erase the file.

P:Prefix. This secondary disk function command is provided in the ProDOS version only. This command will allow you to specify the full or partial disk prefix. If you do not wish to change the current prefix, just enter [RETURN]. Don't forget to enter the slash (/) before a volume prefix. Do not enter the null prefix (/ only).

S:Slot. This secondary disk function command will allow you to select the slot number for the active disk drive. In the DOS 3.3 version, the current slot number will be shown. If you do not wish to change the current active slot, just enter [RETURN]. In the ProDOS version, you will be asked to furnish the drive number after you enter the new slot number.

In most cases (except emulation files), you may also change the active slot by adding a comma followed by S# after the filename or pathname, where # is the new slot number.

D:Drive. This secondary disk function command will allow you to select the drive number for the active disk drive. In the DOS 3.3 version, the current drive number will be shown. If you do not

wish to change the current active drive, just enter [RETURN].

In most cases (except emulation files), you may also change the
active drive by adding a comma followed by D# after the name,
where # is the new drive number.

L:Load binary file. This secondary disk function command will
allow you to read the contents of a disk binary file directly into
the capture buffer. If there are characters already in the buffer,
the characters read from the binary file will be stored starting at
the end of the current buffer contents. In the DOS 3.3 version, a
binary file cannot be loaded if the current buffer contents exceeds
17919 bytes. A "BINARY FULL" message will be displayed. If the
loading of a binary file causes the 17919-byte limit to be exceeded,
the remainder of the binary file will not be loaded and a "PAR-
TIALLY LOADED" message will be displayed.

This program uses binary files for those special cases where an ex-
act copy of the buffer must be saved and later loaded back into the
buffer. Binary files will be loaded exactly as they are saved on disk
without altering the LF or CR characters. Since this is not a stan-
dard method of saving text to a binary file, the only binary files
which are compatible with MODEM MGR will be those binary files
created by this program.

B:Binary file write. This secondary disk function command will
write the buffer contents to a disk binary file. If the buffer is
empty, a "BUFFER EMPTY" message will be displayed and this
command will be cancelled. The filename or pathname will be
requested. If you don't want to write a file, just enter [RETURN].
After you enter the name, the buffer contents will be saved and the
buffer will be cleared (erased) automatically. If you want to restore
the buffer contents, enter the terminal R command immediately.

This program uses binary files to store text in a different format
than with text files. Text saved in binary files will be saved
exactly as it was captured into the buffer. CR and LF characters
will not be deleted or added. Bit 7 of the characters will not be
altered. In the DOS 3.3 version, no more than 17919 bytes in the
buffer can be saved as a binary file. If the buffer contents exceeds
17919 bytes, a "PARTIALLY SAVED" message will be displayed, and

only the first 17919 bytes in the buffer will be saved in the binary
file.

If you wish to save an unaltered copy of the capture buffer, do not
enter the editor until after you have saved the buffer in a binary
file. The editor will add CR characters in front of all lone LF
characters. Unless you need to have an exact copy of the screen
and cursor operations in the received text, save the buffer in a text
file instead of a binary file.

E:EMULATION ON/OFF

This command toggles terminal emulation on and off. If you toggle
emulation off, a "NO EMULATION" message will be displayed and
the video display will respond only to the common screen command
characters (CR, LF, backspace, and bell). If you toggle emulation
on, a "xxxx EMULATION" message will be displayed and the video
display will respond to those terminal emulation or control com-
mands defined in the currently loaded emulation file. xxxx will be
an abbreviated name for the emulation. If you have not loaded an
emulation file, the message will show "DFLT EMULATION".

F:FULL/HALF DUPLEX

This command toggles between full and half duplex. If the other
system you are communicating with is echoing your transmitted
characters back to you, then you should be in the full-duplex mode.
In the full-duplex mode, your video screen will display received
characters, but will not display your transmitted characters directly.
Your transmitted characters will be displayed when they are echoed
by the other system.

If the other system is not echoing your transmitted characters back
to you, then you should be in the half-duplex mode. In the half-
duplex mode, your video screen will display both received and trans-
mitted characters.

If the other system is echoing your characters back to you and you
are in the half-duplex mode, you will see each transmitted character
when you transmit it and when it is echoed back to you; they will

be displayed ttwwiiccee. If the other system is not echoing your
characters back to you and you are in the full-duplex mode, you
will not see your transmitted characters at all.

In most cases if you are calling a host computer system you should
be in the full duplex mode. If you want to chat with another per-
son who is also using a program in the terminal mode, you probably
both have to use the half-duplex mode with LF insertion (see the I
command).

G:GET NUMBER/HELP or KEYBOARD BLOCK MODE

If you are using the full-screen video mode, the G command is used
to get a phone number list or help file. The phone number list will
allow you to automatically dial from that list. If you are using the
split-screen video mode, the G command is used to toggle the key-
board block mode. The same command results in two different oper-
ations depending on which video mode you are using.

G:GET NUMBER/HELP   (FULL-SCREEN VIDEO MODE)

If you are using the full-screen video mode and you enter the G
command, the program will ask you for the filename or pathname of
the disk file which contains the desired phone number list or help
file. After you enter the name, the file will be loaded. If the
phone number list file is longer than 1024 bytes (DOS 3.3) or 1022
bytes (ProDOS), a "FILE TOO LONG" message will be displayed
and the remainder of the file will not be read. After the file is
loaded, the screen will clear and the contents of the file will be
displayed. You may use the [SPACE] key to stop/start the listing
or the [RETURN] key to terminate the listing.

You can create your own personalized phone list with the editor and
save it as a text file. Be sure to keep the file length to less than
1024 bytes (DOS 3.3) or 1022 bytes (ProDOS). Normally, the phone
list contains names and phone numbers. The exact format is up to
you. However, to dial directly from the list, the phone entries
should include an upper case letter followed by a colon character (:)
followed by the phone number. All of this should be on the same
line. There should be no additional characters following the phone
number on the line.

After the phone list file has been displayed, an "Enter -->" prompt
will be displayed. You may now enter the single upper case letter
which corresponds to the phone number in the list you wish to have
dialed. If that letter and associated phone number does not exist
in the list in the proper format, the program will exit to the termi-
nal mode. If the letter and colon exist, the associated phone number
will be displayed and dialed.

An example phone number list file is shown below.

> COMPUSERVE
> ----------------------
> 300 baud   A:520-9724
> 1200 baud   B:520-9733
> 2400 baud   C:852-8141
>
> Larry's Computer Store
> L:(213)765-4321
>
> MARY:T123-4567

You may dial either of the five numbers by entering A, B, C, L, or
Y when the "Enter -->" prompt appears.

If a help file is read, it will be displayed in the same manner as the
phone list except the "Enter -->" message will not appear. The basic
help file is called HELP and is usually on the work disk. This file
lists the other help files available. If the help file is not on the
currently active disk or the disk specified, it will not be found and
displayed.

Since this command handles ordinary text files, it offers you an
alternative way to display a short (less than 1022 bytes) text file
on the screen. You may store any short memos or reminders or your
own custom help files in a text file and display it with this com-
mand. To prevent the "Enter -->" message from appearing after the
text file is displayed, make the first character in the file a space
and the second character in the file a control-H.

G:KEYBOARD BLOCK MODE (SPLIT-SCREEN VIDEO MODE)

In the split-screen video mode, you can use the G command to toggle
the keyboard block mode. When the keyboard block mode is dis-
abled, any character key you type on the keyboard will result in
the immediate transmission of the associated character to the other
system. The transmitted characters will be displayed on the bottom
screen. If the other system is echoing your transmitted characters,
they will also appear on the top screen.

If the keyboard block mode is enabled, any characters you type on
the keyboard will not be transmitted until you type the [RETURN]
key. After you type the CR, all of the typed characters (including
the CR) will be transmitted. You may type a maximum of 255 char-
acters before you must enter the [RETURN]. The characters will be
displayed in the bottom screen as you type them.

The keyboard block mode is useful in allowing you to type and view
text before sending it. You may use the backspace key to edit the
text. All control characters except control-H can be entered as char-
acters to be transmitted. If your video display has inverse capabili-
ty, control characters will be shown as inverse letters. If your video
display does not have an alternate character set, control characters
will be shown as blanks or shaded blanks.

The block mode with the split screen provides you with the features
of a keyboard line buffer as well as a display of the buffer contents
on the screen.

If you have typed several characters in the block mode and want to
erase all of the entered characters, you can erase the entire block by
entering the [ESC] = command.

If your block is transmitted faster than the receiving system can
handle it, the receiving system can use XON/XOFF control to pace
your block transmission. While your block is being transmitted,
your system will respond to XON and XOFF characters sent by the
receiving system. The XON character is control-Q ($11) and the
XOFF character is control-S ($13). If your capture buffer is on,
any received control-S and control-Q characters will not be captured.

H:HANGUP

This command will hangup your phone connection. This command supports only those modems which will hangup under software or hardware control. Some modems will not hangup under external control, but will hang up if the other system disconnects or if you set a modem switch to off.

I:INSERT AUTO LINE FEED

This command toggles the automatic line feed insertion feature on or off. In many cases your system does not have to transmit a line feed character before beginning a new line. All your system has to send is a CR character at the end of each line. The other system will echo the CR as well as a LF character for your display. If the other system requires a LF as well as the CR, this command can be toggled on to have a LF character sent automatically after each CR character is sent.

If you are chatting with another user, you both probably have to send LF characters as well as CR characters, so use this command to toggle the automatic LF insertion feature on.

Some systems require only a line feed from you (no CR). You can handle this by using the keyboard translation feature provided in the INSTALL program to modify the [RETURN] key to transmit a LF character or you can create an emulation file to do this.

J:PARITY/LENGTH

This command lets you define or change the communications parameters. When you enter this command, a list of several combinations of character length, number of stop bits, and parity will be displayed. The number corresponding to the current combination will be displayed under the cursor. To select a desired combination, enter the number associated with that set. If you don't want to change the current configuration, just enter [RETURN].

For example, suppose the display shows the following list:

Length/stop bits/parity

1)7+2+e
2)7+2+o
3)7+1+e
4)7+1+o
5)8+2+n
6)8+1+n
7)8+1+e
8)8+1+o

Enter --> 6

This shows that the combination associated with number 6 (8-bit characters with one stop bit and no parity) is the current configuration. This is normally the default configuration. If you want to select 7-bit characters with one stop bit and even parity, enter the number 3 when the "Enter -->" prompt is present. If you have a Type 2651, 6551, or 8251 serial card, additional combinations (including mark and space parity) can be defined by specifying the appropriate communications card command and/or control bytes in the INSTALL program.

If you are using an internal serial or communications card with an external "smart" modem, this command will usually configure both the card and the modem. However, the modem must be turned on before this command is issued in order to be effective. Some modems will support only some of these combinations. Refer to your modem instruction manual to determine which combinations are supported.

Some modems will hang up when this command is executed. If this is true for your modem, select the desired parameters before making a connection.

K:KLOCK ON/OFF

If you have a clock card which is supported by this program and you have specified it in the INSTALL program, this command will toggle the clock display on or off. When toggled on, the display will appear in the upper right corner of the screen. You can make

a choice of time-of-day or elapsed time by using the < command. This program displays the time-of-day as hours and minutes in the 12-hour format with AM or PM and the elapsed time is shown in minutes from 00 to 59.

L:LOOK AT STATUS

This command will display the current status of the A, B, P, E, F, X, and S commands. If carrier control is enabled, it will also show the current carrier status. A typical status display is shown below.

AUTO SAVE ON
BUFFER ON
PRINTER OFF
EMULATION OFF
FULL DUPLEX
XON/XOFF ENABLED
<258/33789>
CARRIER ON

This shows auto-save is on, the capture buffer is on, the printer is off, emulation is off, full duplex is the current mode, XON/XOFF is enabled, the buffer has 258 characters with room for 33789 more, and carrier control is enabled with a carrier present. If carrier control is not enabled, the CARRIER status line will not be displayed.

Although this is a lengthy display, any characters received while this list is being displayed will not be lost. You can execute this command while receiving text without missing any characters.

M:MODEM BAUD RATE

This command lets you set or define the communications baud rate. When you enter this command, a list of several baud rates will be displayed. The letter corresponding to the current baud rate will be displayed under the cursor. To select a desired baud rate, enter the associated letter. If you don't want to change the current baud rate, just enter [RETURN].

If you have a Type 6850 serial or communications card, you can
select only two baud rates under program control. One baud rate
(high) is the baud rate set by dip switches on the card. The other
baud rate (low) is one-fourth of the high baud rate. For example, if
you have set the baud rate switches on the card for 1200 baud, you
can use this command to select 1200 baud or 300 baud. If you have
set the baud rate switches on the card for 300 baud, you can use
this command to select 300 baud or 110 baud.

If you have an internal plug-in modem, the only baud rates avail-
able are the baud rates the modem supports. Normally this includes
110, 300, and sometimes 1200 baud.

Suppose the display shows the following list:

    Baud

    A:50
    B:75
    C:110
    D:135
    E:150
    F:300
    G:600
    H:1200
    I:1800
    J:2400
    K:3600
    L:4800
    M:7200
    N:9600
    O:19200

    Enter --> F

This shows that the baud rate associated with the letter F (300 baud)
is the current baud rate. If you want to select 1200 baud, enter the
letter H.

If you have a Type 2651, 6551, or 8251 serial card, you can define
the default baud rate by specifying the appropriate value for the

communications control byte when you use the INSTALL program.

If you are using an internal serial or communications card with an external multi-speed "smart" modem, this command will usually set the baud rates for both the card and the modem. However, the modem must be turned on before this command is issued in order to be effective. If you have a Smart-CAT modem, see the applicable section in Chapter 4.

Some modems will hang up when this command is executed. If this is true for your modem, select the desired baud rate before making a connection.

N:NEW EMULATION

This command will let you load a new emulation file. For DOS 3.3, the emulation file must be on the work disk. For ProDOS, the emulation file must be on the currently active disk. All emulation files have the .EMU suffix in their filenames or pathnames. When this program requests the name, enter the emulation name without the suffix. Chapter 13 describes terminal emulation.

O:ORIGINATE TO ANSWER

Normally your modem is in the originate mode. This is the usual mode to call another system. If your modem supports programmed mode switching, this command will switch your modem from the originate mode to the answer mode. In the answer mode, your modem will enable its carrier and wait for a responding carrier from the other system. When the other carrier is detected, a connection between both systems will be made.

If no connection is made within a period of time (30 seconds or longer, depending on your modem), this command will be terminated and your modem will exit the answer mode.

You would normally execute this command when you have already made a phone voice connection between your system and another user. If both of you want your systems to be switched out of the voice mode and into the data communications mode, one system will have to use the answer mode and the other system will have to use

the originate mode. (To enter the originate mode, see the T command).

Some modems will hang up while switching modes. If you are using a voice phone and want to switch to modem communications, don't hang up the phone until both modems have enabled their carriers and made a connection.

If a phone connection has not yet been made and you want to have your modem answer an incoming call in the answer mode, use the W command. You can also use the U command (unattended mode) to have your modem answer calls. The unattended mode is described in Chapter 10.

P:PRINTER ON/OFF

This command will toggle printing on or off. If you toggle printing on, received text will be printed. Any text read from a disk file or viewed from the buffer (V command) will also be printed.

Generally, it is better to leave printing off when you are receiving text while online. If the receiving rate is 1200 baud (approximately 120 characters per second), many printers cannot keep up with a steady flow of text. Although this program has a printer buffer to store characters which have been received faster than they can be printed, it will only store 1024 characters. When this buffer overflows, the last 1024 received characters will not be printed. If your printer or printer interface card has a large buffer, you may be able to keep up with the received character flow.

Instead of printing while online, we recommended you capture the received text in the buffer and then save it to disk. You can print the file later when you are off-line.

If the program halts while printing is on, there may be a printer problem. Some printer problems (no paper, end-of-ribbon, no handshake, etc.) will create an indefinite pause in the program operation. If this happens, type [ESC] to exit the print mode.

Refer to Chapter 12 for more information on printing.

Q:QUIT

This command lets you quit MODEM MGR. A "QUIT? (Y/N) -->" message will be displayed. Enter Y (for Yes) if you want to quit and enter N (for No) if you don't want to quit.

R:RESTORE BUFFER

If you unintentionally enter the C command and clear the capture buffer, you can restore the contents of the buffer by entering this command immediately. You may find this command useful to restore the buffer after it has been automatically cleared after writing to disk.

If you don't enter this command immediately and subsequent received characters are captured into the buffer, the buffer will contain a mix of the old text overlayed with new text. If you enter the restore command by accident, you may also find a strange combination of old and new text in the buffer.

If you clear the buffer twice before any characters are captured, this command will restore the contents of the buffer before the last clear command. Since the buffer was clear before the last clear command, the buffer will remain empty.

S:SPACE IN BUFFER

This command will display the space used and the space left in the capture buffer. The first decimal number will be the number of characters in the buffer and the second decimal number will be the number of character spaces left in the buffer. The sum of the two numbers will always be the same.

For example, if you have a 64K Apple with DOS 3.3, the following are typical displays:

<0/34047>	This means the buffer is empty.
<17023/17024>	This means the buffer is half full.
<34047/0>	This means the buffer is full.

If you are using ProDOS, the total space will be 25343 instead of

34047. If you have a 48K Apple with DOS 3.3, the total space will be 17919 instead. All control characters count as one character.

T:TELEPHONE DIAL

This command will provide dialing if your modem supports it. This command can also be used to switch the modem to the originate mode. When this command is entered, "DIAL" and "Enter -->" messages will be displayed. If you enter a ?, the default and last dialed numbers (if any) will be displayed. You may specify the default number when you configure this program with the INSTALL program.

If you wish to dial the default number, enter D. If you wish to re-dial the last number dialed, enter Z. If you don't want to dial a number, enter [ESC] to quit. Do not enter [RETURN] to quit the dial command because this will switch the modem to the off-hook originate mode. This will be discussed later.

If you want to enter a phone number, type the number on the key-board followed by a [RETURN]. The number must have no more than 32 characters. You may enter the numbers 0 through 9 (and # or * for tone dialing) and the following letters and punctuation symbols:

T	Tone dial following numbers
P	Pulse dial following numbers
,	2 second pause
()/-	Allowed, but ignored
[SPACE]	Allowed, but ignored
RW;	Allowed for some modems

Enter the letter P to use pulse dialing for all following numbers. If your modem supports tone dialing, enter the letter T to use tone dialing for all following numbers. You may use the (,), /, -, and space char-acters anywhere to improve clarity. The characters R, W, and ; can be entered for some modems which support them. Refer to the mo-dem manual for information on these dialing commands.

As an example, suppose you enter the following:

P9,,T1,(714) 555-1212

This will pulse dial the 9, wait for four seconds, tone dial the 1, wait for two seconds, and tone dial the 7145551212 numbers.

If your "smart" modem supports additional dialing features not covered in this command, you may set the modem in the command mode and use the direct command string which the modem recognizes instead of using this T command.

With some internal plug-in modems, you may enter a minus (-) as the first character to disable the speaker. Refer to the applicable section for your modem in Chapter 4.

When you execute this dialing command with the Novation Smart-CAT modem, it will provide a five-second pause instead of a two-second pause when the comma (,) is used. This modem will also provide a five-second pause when the T letter is used for tone dialing.

Some external auto modems will support pulse dialing with this command if you connect the appropriate off-hook control line on the modem to pin 14 of the game port I/O connector. Refer to the applicable section in Chapter 3.

You can also use the T command to enter the off-hook originate mode. If you enter [RETURN] instead of a number or letter, your modem will be placed in the originate mode. The modem will wait for a carrier from the other system. When a carrier is received, your modem will enable its own carrier and a connection will be made. If a carrier is not received, your modem will wait a certain length of time (30 seconds or more, depending on your modem) until it quits and hangs up.

U:UNATTENDED OPERATION

This command allows your system to operate in an unattended mode. It will answer the phone when called, and allow a remote user to exchange messages or disk files with your system. Password protection is provided. This operation is described in Chapter 10.

V:VIEW BUFFER

This command allows you to view the present contents of the buffer
on the video screen. If your buffer does not have any characters in
it, a "BUFFER EMPTY" message will be displayed. If your buffer
is not empty, the screen will clear and the contents of the buffer
will be displayed. You can control the screen scrolling speed by
pressing any of the number keys from [1] (slowest) to [9] (fastest).
The initial viewing speed corresponds to the number [5] key. You
can stop the scrolling by pressing the [SPACE] key and you can re-
start the scrolling by pressing any other key except the [RETURN]
key. You can terminate the view command by pressing the
[RETURN] key.

If you have XON/XOFF enabled, the XOFF character will be sent
when you execute this buffer viewing command. After the buffer
viewing is completed, the XON character will be sent automatically
by this program if XON/XOFF is enabled. If you are connected to
another system which responds to XON and XOFF, this will signal
the other system to stop sending while you are viewing the buffer.

Another way you can view the buffer contents on the video screen
is to enter the editor. The editor allows viewing in either the for-
ward or reverse direction. Chapter 7 describes the editor.

If terminal emulation is off, all control characters in the buffer
will be ignored by the video display except the following:

>   Control-G   Bell
>   Control-H   Backspace
>   Control-J   LF
>   Control-M   CR

If terminal emulation is on, any control characters or lead-in se-
quences in the buffer will result in the video display operations de-
fined by the currently loaded emulation file.

If you type a control-C, all control characters (except control-J and
control-M) will be displayed as a circumflex or caret character (^)
followed by the associated letter character. For example, control-G
(bell) will be displayed as a ^G and the bell will not be heard. If

you type a control-X, all control characters **including** control-J and control-M will be displayed as the caret character followed by the associated letter character. The CR and LF operations will also be displayed. The ^M will be displayed before the associated CR screen operation and the ^J will be displayed after the associated LF screen operation to the next lower line. The display of control characters will be terminated if you type the [SPACE] key.

If you toggle the printer on, the buffer contents will also be printed on the printer. If the printer speed is slower than the selected viewing speed, the printer speed will pace the scrolling speed. If the printer has a buffer, the screen scrolling will be normal until the buffer is full. When the printer buffer is full, the scrolling will usually stop until a portion of the buffer has been printed.

If you type [CTRL] P while the buffer contents are being displayed on the video screen, the printer will toggle on or off. To print a portion of the buffer, you can use the number and [SPACE] keys to locate and stop at the desired point in the text and enter the [CTRL] P to start printing. Enter another [CTRL] P when you wish to stop printing.

You can also use the editor to imbed a print control character in the buffer text to control the printer during the buffer viewing operation. First, you must specify the print control character in the INSTALL program. The default value is $FF, which means there is no print control character. If you want to use the control-X character (hexadecimal 18), specify 18 in the INSTALL program as the imbedded print control character. With the text in the buffer, use the editor to place a control-X wherever you want printing to start and stop. Remember the printer must be initially on so you would probably place a control-X at the beginning of the file to turn the printer off (unless you want to start printing from the beginning). Finally, use the P command to toggle the printer on and use the V command to view the buffer. The printer will start and stop wherever you have placed the control-X characters.

If the text contains some stray control-X characters introduced from some other source, you may find your printer unexpectedly stopping and starting (if it is initially toggled on) or you may find

the scrolling halts. If this happens, use the [ESC] key to exit. You can remove any undesired control characters by entering the editor and using the ^O command. You should use an uncommon control character as the imbedded print control character.

W:WAIT FOR CALL

If your modem has the capability to automatically answer calls in the answer mode, this command will set your modem to wait for a call. When an incoming call occurs, your modem will answer the phone, enable its answer carrier, and wait for the caller's modem to respond with an originate carrier. When the originate carrier is detected, a connection will be made and your system will enter the terminal mode. If the other carrier is not detected within a period of time (30 seconds or longer, depending on your modem), this command will terminate and your modem will hang up and exit the answer mode.

If you wish to cancel this command before a call is received, press the [ESC] key.

To use this command with an external "non-smart" modem, carrier control must be on (enabled) and your modem carrier-detect signal must be properly interfaced to your computer.

If you are using an internal plug-in modem or an external "smart" modem, carrier control can be ON or OFF. If carrier control is ON, the carrier-detect signal from your external "smart" modem must be properly configured and interfaced to your computer. This is described in Chapter 11.

X:XON/XOFF

The X command will enable or disable XON/XOFF. XOFF is a control character your system sends to the other system to direct that system to stop transmitting to you. XON is a control character your system sends to direct the other system to resume transmitting again. You may define the control characters used for XON and XOFF in the INSTALL program according to the requirements of the system you are communicating with. The default characters are control-S for XOFF and control-Q for XON.

There are several different situations where XON and XOFF are sent by MODEM MGR.

1) Input Buffer XON/XOFF Control - This program uses an input buffer which stores characters when they are received faster than they can be displayed. This buffer is not the same as the capture buffer. If XON/XOFF is enabled, this program will send XOFF automatically to the other system whenever the input buffer is nearly full. If the other system responds to XON/XOFF, this will direct that system to stop transmitting. After all of the characters in the input buffer are displayed on your video screen, the input buffer will be empty and this program will send XON to the other system to direct it to resume transmitting again. There are no status messages displayed when XON or XOFF is sent under these conditions. If XON/XOFF is disabled, XOFF will not be sent when the buffer is full. If the other system continues transmitting when your input buffer is full, buffer overflow will occur and the last 1024 characters received will be lost.

The filling of the input buffer described above will occur if you are receiving a continuous stream of characters at 19200 baud with a video card which cannot handle display speeds of 19200 baud. It will also occur if the received characters contain a lot of control characters or video command sequences which result in slow screen operations (such as clearing the screen, deleting a line, or beeping the speaker).

2) Disk or View XON/XOFF Control - If XON/XOFF is enabled, this program will send XOFF automatically when you select the disk functions (D) or view buffer (V) commands. This will direct the other system to stop transmitting while your system is busy. When the disk or viewing operation is completed, this program will automatically send XON. A status message will appear whenever XON or XOFF is transmitted under these circumstances.

If you have XON/XOFF enabled and you do not see the XON or XOFF status messages when you select the D or V commands, you may have sent XOFF on the keyboard without following it eventually with a XON. (See next paragraph).

3) Keyboard XON/XOFF - You may send XOFF or XON directly
from the keyboard. You can do this even if XON/XOFF is disabled.
You can send XOFF by typing the control character (usually control-
S). You should eventually follow this by typing the XON control
character (usually control-Q). This program will recognize when
you have done this, but will not display a status message. If you
type the XOFF character to direct the other system to stop trans-
mitting, you must type the XON character when you wish to have
transmitting resumed.

If you send XOFF by typing the XOFF character, this program will
no longer send XON or XOFF for a disk (D) or view (V) command
until you have sent XON by typing the XON character. This pro-
gram will not over-ride your typed XOFF command.

If you unknowingly type the XOFF character by mistake, the other
system will not transmit to you and communications may appear to
have halted.

4) Macro XON/XOFF - You may also program a macro command to
send XON or XOFF. XON/XOFF does not have to be enabled to do
this. All of the previous comments on keyboard XON/XOFF apply to
macro XON/XOFF commands. Chapter 8 describes macro commands.

5) Macro Disk XON/XOFF - If you use a macro command to save
the buffer to disk, XOFF will be sent before the disk save and XON
will be sent after the disk save if XON/XOFF is enabled.

Whenever XON/XOFF is toggled from disabled to enabled, this pro-
gram will send the XON character automatically. If you have been
typing XOFF and XON on the keyboard and have forgotten what
you sent last, toggle XON/XOFF from enabled to disabled to enabled
again. This will restore everything to a known state.

You can define the characters used for XON and XOFF in the
INSTALL program. If you define the XON and XOFF characters
as 00, XON and XOFF will not be automatically transmitted by this
program even if XON/XOFF is enabled.

XON/XOFF is not automatically sent if the printer buffer becomes
full when you are printing while online.

Y:FILE TRANSFER

This command lets your system exchange buffer or disk files with
another system. Text files can be sent at normal speed, slow speed,
after each character is echoed, or with XON/XOFF pacing. Text
can also be sent one line at a time with a specified delay between
lines or after a prompt is received.

Protocol file transfer with error checking and correction can also
be performed. This program supports both the XMODEM protocol
and a special MMGR protocol.

The file transfer operation is described in Chapter 9.

Z:EDITOR

This command loads the editor to allow you to edit the present con-
tents of the capture buffer. The editor also allows the editing of a
disk text file or the creation of new text files. This is a full-screen
editor with commands which support file handling, cursor moves,
line scrolling, paging, character insertion, file insertion, character
deletion, line deletion, search/replace, search/delete, and column
formatting.

If you are planning to create and use message files, macro files,
function keys files, or phone list files, you should learn the use
of this editor. The editor is described in Chapter 7.

@:EXECUTE MACRO

This command will load and execute a macro script file. A macro
script file contains a sequence of pre-programmed commands which
can control most of the functions of this program. When it is exe-
cuted, the commands in the file will be performed in sequence with-
out requiring any further action on your part. A complete operation
including dialing, providing a password, requesting information,
saving any replies to the buffer or a disk file, and hangup can be
defined in a macro script file.

After you enter this command, the program will request the file-
name or pathname of the macro script file to be executed. After

you enter the name, the file will be loaded and the commands in the
file will be executed.

Macro commands and script files are described in Chapter 8.

0:LOAD FUNCTION KEYS
1-9:FUNCTION KEYS

The 0 command will display the contents of the resident function
key file (if any) and will allow a new file to be loaded. After a
function key file is loaded, you can use the [ESC] 1 through [ESC]
9 commands to execute the corresponding function defined in the
file. The functions are sequences of macro commands in the same
format as those used in macro script files. Function keys and func-
tion key files are described in Chapter 8.

<:TIME/TIMER

This command will switch between the time-of-day and elapsed time
display in the upper right corner of your video screen. You must
have one of the clock cards listed in the INSTALL program properly
installed in order to use this feature. If you have used the K com-
mand to set the clock feature off, neither time-of-day or elapsed
time will be displayed.

;:RESET TIMER

The ; command will reset the elapsed time display to 00 minutes. You
must have one of the clock cards listed in the INSTALL program
properly installed in order to use this feature.

^:SEND BREAK

This command will send a continuous space or break condition for a
period of approximately 230 milliseconds. In many systems this can
be used to interrupt the current process and gain the attention of
the other system.

^V:SNAPSHOT

This command places a "snapshot" of the screen in your capture

buffer. You must execute this command from the terminal mode and not from the terminal command mode. Do **not** press the [ESC] key to display the "Command?-->" message before you enter this command. When you enter [CTRL] V in the terminal mode, the text displayed on the screen will be saved in the capture buffer. The capture buffer does not have to be on. If there is some text in the capture buffer, the screen text will be saved at the end of the existing buffer contents.

All of the text on the screen from the top line (including the clock display) to the line just above the present cursor position will be saved to the buffer. There will be no status message displayed when this command is executed, but the cursor will momentarily disappear while the screen is being saved.

This command is useful for saving text on the screen which was received when the capture buffer was off. This is not an efficient way to save text because all of the blank spaces on the screen are saved as space characters in the buffer. For example, the following text line has 27 characters followed by a CR/LF:

This line has 27 characters

On an 80-column screen, this line is followed by 53 blank spaces. If the capture buffer is on, it will save the 27 characters and CR plus LF for a total of 29 characters. The snapshot command will save the 27 characters plus the 53 blank characters for a total of 80 characters in the buffer. Therefore, the snapshot command uses a lot of buffer space and should be used sparingly.

If you want to use a different control key to execute this command instead of control-V, you can define another control key when you run the INSTALL program.

=:CLEAR KEYBOARD BLOCK

The = command applies only in the split-screen video mode. If the block mode is enabled, this command will clear all of the characters in the block. If you have typed some characters into the block and decide not to transmit them, this will allow you to erase the block.

This command will also clear the characters displayed in the lower screen.

>:VIDEO FORMAT

This command applies only in the full-screen video mode with some 80 column cards installed in one of the expansion slots of a][+ or a //e. This command allows you to change the video column and/or row format.

If you are using a Videx Ultraterm video card, you have a choice of any one of eight video formats. After the command is entered, a "V" will be shown on the screen along with a number under the cursor which corresponds to the current video format. Enter a new number to select another video format. The number to enter and the associated video format is listed below for the Ultraterm card (* = interlaced).

    1) 80 X 24
    2) 96 X 24
    3) 160 X 24
    4) 80 X 24 *
    5) 80 X 32 *
    6) 80 X 48 *
    7) 132 X 24 *
    8) 128 X 32 *

You may define the default video format for the Ultraterm card when the INSTALL program is run.

If you have a non-Ultraterm 80-column card in one of the expansion slots of an Apple][+ or Apple //e, you have a choice of two video formats with this command. These are listed below.

    0) 80 X 24
    1) 64 X 24

This command is not supported for the 40-column video, the split-screen video mode, the //c, or any video card in the auxiliary slot of the //e.

DISPLAY FORMAT PROBLEMS

This section describes some of the display problems you may en-
counter and the possible causes. If emulation is off, this program
defaults to the following display format:

1) The end of each received line must include a CR and a LF
character.

2) If a CR and LF are not received, the line will eventually ex-
tend to the right column and wrap down to the next line.

3) When the last row is displayed, the screen will scroll up one
line and subsequent text will be displayed on the bottom row.

If you are receiving mostly double line feeds, you may have en-
abled emulation and the presently loaded emulation file may be
using $0D for the newline video function. Another possible cause
is you may have used the I command to send a LF after each CR
and the other system is echoing your LF.

If you are receiving occasional double line feeds when the line ex-
tends all the way to the right column, it may be caused by the dis-
play wrap. If the last character in the line is in the last column,
your display will wrap down to the next line. When the other sys-
tem sends the CR/LF marking the end of that line, your display
does a second line feed. This can be prevented if you prepare and
use an emulation file with display wrap OFF. There is another
way you can solve this. If the other system provides a choice of
screen formatting, set formatting off or set the format for one
less column than your screen supports. For example, if you have
an 80-column screen, direct the other system to send you text in a
79-column format.

If your screen is not displaying CR, but is displaying LF instead,
it means the other system is sending the LF character only without
a CR. Prepare and use an emulation file which uses the $0A char-
acter for the newline function. The D200.EMU emulation file pro-
vides an example of this.

If your screen is not displaying LF, but is displaying CR, it means

the other system is sending the CR character only without a LF at the end of each line. Prepare and use an emulation file which uses the $0D character for the newline function.

If the other system is sending text which is properly displayed on your screen, but is not echoing your transmissions, it may be assuming you are in half duplex. You may have accidentally directed the other system to use that mode. Direct the other system to support you in the full-duplex mode or switch your system into half duplex.

DISPLAY CHARACTER FILTER

If emulation is off, the video display will not respond to any control characters except the following: CR, LF, bell and backspace. Essentially all other control characters are ignored or filtered out by the video display. If you wish to filter any of these four control characters out, or add some control characters to support special video functions, prepare and use an emulation file which responds only to those control characters you desire.

CAPTURE CHARACTER FILTER

If the buffer is on, all received control characters except the null (00) character are captured in the buffer. Control characters are not filtered out so an exact copy of the captured session can be replayed. If you wish to remove certain control characters from the buffer before saving the contents to disk, use the editor ^O command.

The capture of nulls is allowed only if you have set the "Capture nulls" default to YES when the INSTALL program was run or if the 00 is part of a video lead-in function.

CHANGING SLOTS, DRIVES, OR PREFIXES

There is always one disk which is the presently active disk. This usually starts out as the disk from which this program was booted. If you don't specify another disk, all text file read and write operations will be made with this active disk.

Here is a summary of the several ways you may change the currently active disk to another.

1) When you enter a filename or pathname, you may add the S#
and/or D# suffixes to change the active slot and/or drive.

2) From the terminal command mode, you may enter the DD#
command to set the active disk drive to number #.

3) If you enter the DC disk catalog command, follow it with 1 or
2 immediately to change the active disk number to 1 or 2.

4) With ProDOS, you can use the DP command and enter the
prefix of the volume you want. Don't forget to use the slash (/)
character before a volume prefix. Don't enter the null prefix.

RUNNING FROM PRODOS BASIC.SYSTEM

The simplest way you can start the ProDOS version of MODEM
MGR is to boot the work disk. However, suppose you have booted
ProDOS from another disk and you are using the BASIC.SYSTEM.
If you want to run MODEM MGR which is in the volume directory
of the work disk, you must first set the prefix to the work disk
prefix or set the null prefix. If you haven't run any programs or
used the PREFIX /xxxx command since booting the ProDOS disk,
the null prefix is probably in effect.

After you have set the work disk prefix or the null prefix, enter
-MMGR.SYSTEM. You may use the S# and/or D# options to spe-
cify the slot and/or drive numbers of the work disk. For example,
suppose the /MMGR work disk is in slot 5, drive 1. You may use
any of the following sets of commands to run MODEM MGR.

PREFIX /MMGR
-MMGR.SYSTEM

PREFIX ,S5,D1
-MMGR.SYSTEM

PREFIX /
-MMGR.SYSTEM,S5,D1

The last example establishes a null prefix before starting the program. After MODEM MGR is running, you may change the prefix.

RUNNING FROM PRODOS SUBDIRECTORY

The preceding section applied if MODEM MGR and its program modules were in the volume directory. The MODEM MGR programs can be transferred to a sub-directory. All of the following programs must be in the same sub-directory:

        MMGR.SYSTEM
        MDP0
        MDP1
        MDP2
        MDP3
        MDP4

Before starting the program, you must initially set the prefix to the sub-directory the programs are in. This will tell MODEM MGR where to find the program modules. After starting MODEM MGR, you may change the prefix. For example, suppose the programs are in the sub-directory /BIGDISK/COMM/TELE. If BASIC.SYSTEM is active, enter the following commands to start the program:

PREFIX /BIGDISK/COMM/TELE
-MMGR.SYSTEM

Due to space limitations, this program limits the full prefix up to and including the sub-directory name to 57 characters or less. Even if you use a partial pathname, the total number of characters including the volume name and the leading slash (/) character must be 57 or less. If the over-all prefix is longer, an error message will appear when the program is started.

VIDEO DISPLAY RATE

This section discusses text display at high baud rates (9600 baud and above).

Although most direct-dial modems in current use operate at 300, 1200, or 2400 baud, faster modems are being introduced. This

program was designed to support modem baud rates up to and including 19200 baud. Although this program can receive and send text at 19200 baud, the maximum baud rate at which text can be correctly displayed on the video screen depends on the type of video card used and the type of screen functions being displayed. Certain screen operations (like clearing the screen or beeping the speaker with a control character in the text) take more processor time than simply displaying a character.

This program has an input buffer to store received characters. This prevents loss of characters received during a slow screen operation. However, the buffer has a finite size (1024 bytes). If too many slow screen operations are performed in succession, the buffer will overflow and the previous 1024 characters received will be lost. Even when ordinary text is being displayed without special screen operations, the use of a buffer cannot overcome the basic speed limitation of the video card when characters are being received continuously at a faster rate than the video device is capable of displaying. The only way to handle a non-stop flow of received characters is to program the video display routines so they are faster than the received character rate.

This program does not use the built-in video firmware routines for displaying characters. The firmware routines were designed for compactness and not for speed. Instead, this program accesses the video RAM and controller registers (where applicable) directly. As a result, this program will receive and display "ordinary" text at the following baud rates continuously (non-stop) without losing characters:

Video card in expansion slot (full-screen):   19200 baud
Video card in expansion slot (split-screen):   7200 baud
Video card in auxiliary slot (full or split):   9600 baud
//c 80-column (full or split):   9600 baud

"Ordinary" text is defined here as 30 to 79 characters per line followed by a CR and LF character. Note the video card in the expansion slot has the fastest display capability in the full-screen mode, but the slowest display capability in the split-screen mode.

The baud rates listed above are for continuous non-stop received text without special screen functions. Usually text is not received continuously. The video devices listed above can be used at 19200 baud if the transmitted text pauses at intervals. It only takes a short pause for the video display to catch up. If special screen functions occur, longer pauses are required.

If the transmitting system supports it, you can use XON/XOFF flow control for text received at rates faster than your video display can handle. However, if you are running a program on a remote system which uses the XON and XOFF characters for other program commands, you will have some conflict.

The best way to determine whether MODEM MGR meets your high-speed display rate requirements is to try it under worst-case operating conditions and see if you lose any received characters. If the input buffer overflows, you will lose 1024 received characters, so the loss will be evident. If this happens, use the next lower baud rate.

C H A P T E R   7

E D I T O R

The editor lets you create or edit text in the capture buffer. You
may also edit text loaded from disk files. The editor can be used
with any standard Apple text file including the macro script,
function key, help, and phone list files used by this program.

The editor is a full-screen editor which is similar to the editor
portion of a word processor. It displays a screen page of the part
of the text being edited. You may enter edit commands to move
through the text to perform editing changes. Since a lot of features
are available, there are many editing commands. However, it is
not necessary to learn all of the commands to use the editor. You
need only a few of the basic commands to perform most editing
tasks.

The capture buffer and the editor buffer are the same so you may
edit any text captured while online by simply running the editor.
Any text changes made with the editor will be made directly to the
text in the buffer. When you exit the editor, the newly edited text
remains in the buffer and can be transmitted, viewed, saved to disk,
or re-edited.

If you want to keep a copy of the original unedited text, you must
save the buffer contents before editing it. The editor does not
automatically save a backup copy of the original file. Remember
that the buffer will be cleared after it is saved to disk while in
the terminal mode so you will have to restore the buffer after the
save. If you save the buffer to disk while in the editor command
mode, the buffer will not be cleared and you do not have to
restore it.

The editor is compatible with all of the screen formats used by
MODEM MGR. This includes the 40-column, 80-column, 64-column,
and split video modes, as well as all eight of the Ultraterm video
formats. Switching between Ultraterm video modes can be accomp-
lished in the editor command mode.

To perform editing, you must move from the terminal mode to the
editor command mode. From the editor command mode, you can then
enter the editor. A summary of the commands to move from one mode
to the other is summarized below.


```
TERMINAL  ---Z--->  EDITOR   ----E---->
COMMAND             COMMAND              EDITOR
  MODE    <--QY---   MODE    <--[ESC]--
```


Enter the Z command to move from the terminal command mode to
the editor command mode. After a few seconds of disk activity,
the editor will be loaded. You will see an "Edit command? -->"
prompt displayed. If you issue an E command in the editor com-
mand mode, you will move to the editor where you can perform text
editing. You can escape from the editor back to the editor command
mode by pressing the [ESC] key. Finally, you can return to the
terminal mode by entering Q (for Quit) followed by Y (for Yes) to
confirm you wish to quit the edit command mode.

Although these sequences of commands appear complicated, there
are menus and prompts to remind you how to move to and from the
editor. After some usage, you will easily remember these commands.

Figure 7-1 shows a menu of commands in the editor command mode.
You can display this menu in the editor command mode by entering
a ? when the "Edit command? -->" prompt is displayed. Figure 7-2
shows a menu of editing commands in the editor. You may display
this menu in the editor at any time by entering a [CTRL] Q.

EDITOR COMMAND MODE

You can enter the editor command mode by selecting the Z command
while you are in the terminal command mode. In the DOS 3.3 ver-
sion, the work disk must be in the same drive that the program was
started in. If it is not in the same drive, the editor module will not
be found and the program will attempt to return to the terminal
mode. If the work disk is not in the same drive, the terminal pro-
gram module will not be found either and the program will halt.
An error message will prompt you to insert the work disk in the

EDIT COMMANDS

C:Clear buffer
D:Disk functions
E:Editor
P:Printer ON/OFF
Q:Quit edit
R:Restore buffer
S :Space in buffer
V:View buffer
? :This menu
> :Video format

Figure 7-1. Edit command menu

EDITOR COMMANDS

Cursor Commands	Scroll Commands
^S Char Left *	^W Line Up
^D Char Right *	^Z Line Down
^E Line Up *	^R Page Up
^X Line Down *	^C Page Down
^A Word Left	^T Top of File
^F Word Right	^B Bottom of File

Other Commands	Delete Commands
^I Insert ON/OFF	^G Delete Char
^O Find/Replace	^L Delete Line
^P Put control char	^N Del to line end
^V Video format	^O Find/delete
^Y Yank disk file	^@ Del to begin/end
^Q Quick menu	

* Use arrow keys also

Figure 7-2. Editor Menu

drive and press any key to re-start the program. After you return
to the terminal mode with the work disk in the proper disk drive,
you can try to enter the editor command mode again with the Z
command.

When you are in the editor command mode, the following edit com-
mand prompt will be shown:

    Edit command? -->

The edit command menu in figure 7-1 shows all of the available
commands in the editor command mode. To execute an editor
command, enter the single letter in the menu associated with each
command. For example, you can clear (erase) the text buffer by
entering the letter C. You do not have to enter [ESC] before each
editor command. Many of the editor commands are the same as
commands used in the terminal mode. Therefore, only a brief
description will be given below for each editor command.

C: Clear buffer

This command clears (erases) the contents of the text buffer. If
you have used this command by mistake and wish to restore the
text buffer, see the R command.

D: Disk functions

This command allows you to perform disk functions in the editor
command mode. You may read or write text or binary files to or
from the text buffer. Any disk file read to the text buffer will
be appended at the end of any existing text in the buffer. (If you
wish to insert a text file elsewhere in the buffer, you can use the
control-Y command in the editor. This will be described in the
editor section).

When you enter the D command, this program will display a disk
functions menu. The disk functions are exactly the same as those
supported in the terminal command mode with one exception: when
the text buffer is written to disk, the text buffer is not automa-
tically cleared. This allows you to make periodic saves while
editing without losing the contents of the buffer. Since these disk

commands are exactly the same as those in the terminal mode,
they will not be discussed further.

E: Editor

This command places you in the editor where you may perform
editing of the text. A full description of the editor is presented
later in this chapter.

P: Printer ON/OFF

This command toggles printing on or off. Use this command to
print the contents of the text buffer when the V (View buffer)
command is executed. You can perform printing while in the
editor command mode, but not while in the editor mode.

Q: Quit edit

This command allows you to quit the editor command mode and
return to the terminal command mode. You will be asked to con-
firm your request to quit. Answer Y (for Yes) to quit and return
to the terminal mode or answer N (for No) to remain in the editor
command mode.

R: Restore buffer

If you have cleared the buffer (using the C command) and want
to restore the buffer to the condition before it was cleared, enter
this command immediately. If this command is entered after new
text has been added to the buffer, the buffer may end up with a
combination of newly added text overlaying the earlier text that
was cleared and restored.

S: Space in buffer

This command will display the space used and remaining in the
buffer in bytes. The first decimal number is the number of bytes
(characters) used and the second decimal number is the space
available for additional bytes. A CR/LF combination uses two
bytes.

V: View buffer

This command lets you view the contents of the text buffer. The text will scroll on the video screen from the beginning to the end. You may control the scrolling speed by pressing any one of the keyboard number keys from [1] (slow) through [9] (fast). You can stop and restart the scrolling by pressing the space key. You can cancel the view mode by pressing the [RETURN] key.

If you type [CTRL] C while viewing, all control characters (except control-J and control-M) will be displayed as the circumflex or caret character followed by the associated letter character. For example, control-G will be shown as ^G. If you type [CTRL] X, all control characters (including control-J and control-M) will be displayed as the circumflex character followed by the associated letter character. You may toggle the printer on or off by entering [CTRL] P while the text is scrolling.

?: This menu

This command displays the edit command menu.

>: Video format

This command applies if you are using the Ultraterm video card in the normal (non-split) format. You can select any of the eight Ultraterm video formats by entering this command followed by a number from 1 to 8. For example, the command 8 will select the 128-column by 32-row mode. Some video cards will switch between 80-columns and 64-columns if you enter this command followed by the number 0 or 1.

EDITOR

The editor is where you accomplish the actual editing of the text. Enter the editor by selecting the E command while you are in the editor command mode. You can type the [ESC] key to exit from the editor back to the editor command mode. When you enter the editor, the video screen will initially clear and the cursor will appear at the top left corner of the screen. If any text is in the buffer (previously loaded from a disk file or captured from an on-

line session), it will appear on the screen. If the buffer is empty, nothing will appear on the screen except the cursor.

DISPLAY

If you captured text in the buffer during an online session, then each video line of the text is probably terminated by a CR/LF combination. The CR/LF combination is not represented directly as a visible character on the video screen. It is represented by a blank space at the end of the line. The cursor can be placed on the space which represents the CR/LF combination at the end of the line.

If the length of the text line is greater than the video screen width, the text will wrap around to the next line below.

The cursor will always appear on a visible text character except when it is positioned on one of the following:

1) Space character
2) CR/LF combination
3) End of file (or empty buffer)

If the cursor is not at the end of the file and the cursor appears to be on a "blank", there is either a space character or a CR/LF combination there.

All control characters in the text (except control-J and control-M) are represented by a circumflex or caret character followed by the letter character associated with the control character. For example, a control-G will appear as ^G. Control characters in the edited text will be discussed in more detail later in this chapter.

You may enter text directly from the keyboard. The text you enter will appear on the screen and will be inserted into the text buffer. We recommend you enter a [RETURN] at the end of each video line before the right margin is reached. (Like using a typewriter). This places a CR/LF combination at the end of each video line. The editor does not automatically insert a CR/LF during keyboard entry.

You may allow a sentence to wrap around to the next line below
without entering a [RETURN], but this may slow some editing
functions if a line is wrapped too many times. The editor does
provide a formatting command (described later) which will reformat
the text into the number of columns you specify. Reformatting
will place the CR/LF in the proper position near the end of each
video line so that word splitting does not occur at the right
margin.

A description of each of the editor commands is given below.
We recommend you load a text file into the buffer and use each
editing command as you read its description below. There is a
file with editing instructions called TUTOR which you can load
and read as you edit it.

MOVING THE CURSOR

You can edit the text by moving the cursor to the desired location
in the text and performing the edit function. There are several
ways you can move the cursor through the text.

You can move the cursor one character to the left or right by
using the left or right arrow keys on the keyboard. You can move
the cursor one line up or down by using the up or down arrows on
the keyboard (not available on the][+).

There is another way you can move the cursor using the [CTRL]
keys. This method has been used with several popular word
processors. Notice the arrangement of the following keys on the
keyboard:

```
                    E
      CTRL      S   D
                X
```

The S, D, E, and X keys are elements of a diamond pattern on the
keyboard which correspond to the left, right, up, and down direc-
tions, respectively.

You may move the cursor one character to the left by entering
[CTRL] S. To move the cursor to the right, use [CTRL] D. You

may move the cursor one line up by entering [CTRL] E or one line down by entering [CTRL] X.

The relative position of these keys on the keyboard corresponds to the direction the cursor will move in response to your control key commands. Depending on your preference, you may use the arrow keys or the control keys to move the cursor.

If the cursor is in the far right column or on a CR/LF character and you try to move it further to the right, it will move down to the first column of the next line. If the cursor is in the far left column and you try to move it further to the left, it will move to the end of the text on the line above.

If the cursor is on the bottom video line and you try to move it one line down, the text will automatically scroll up one line. If the cursor is on the top video line and you try to move it one line up, the text will automatically scroll down one line. You can never move the cursor off the video screen. If you try to move the cursor off-screen, the text will scroll and the cursor will end up on the next line of text.

If you move the cursor to the beginning of the text file, you will not be able to move the cursor further to the left. If you move the cursor to the end of the text file, you will not be able to move the cursor further to the right. You can never move the cursor beyond the file or to a position where there is no text. (The CR/LF "invisible" character is considered part of the text wherever it occurs.)

CURSOR TO WORD LEFT OR RIGHT

There are times when you may wish to move the cursor more than one character at a time to the left or right. Let us now use the adjacent A and F keys on the keyboard as control keys.

```
                  E
     CTRL  A   S  D   F
                  X
```

This diagram shows the relative position of the A and F keys along

with the previously discussed S, D, E, and X cursor keys. Notice
the F key is on the far right and the A key is on the far left.

If you enter [CTRL] F, the cursor will move to the first character
of the next word to the right. If you enter [CTRL] A, the cursor
will move to the first character of the present or next word on
the left. ([CTRL] A will not do this if it is being used as the
shift key on the][+).

SCROLL ONE LINE UP OR DOWN

One advantage of using these control keys for cursor control is
the other editing commands which control text positioning are
built around these commands in a logical fashion. There are
several editing commands which control the text displayed on the
video screen. For example, the W and Z control keys allow text
scrolling.

```
               W   E
     CTRL  A   S   D   F
               Z   X
```

Note the W key is above the Z key on the keyboard. If you want
to see the next line beyond the top of the screen, the [CTRL] W
command will scroll the text down one line so you can see the next
line at the top of the screen. If you enter [CTRL] Z, the text will
scroll up one line and you will see the next line at the bottom of
the screen. Therefore, if you want to see the next line at the top or
bottom of the screen, enter [CTRL] W (top) or [CTRL] Z (bottom).

When these two keys are used to scroll one line up or down, the
cursor will remain in the same position unless the cursor is on
the top or bottom line. Since the cursor can never be forced off
the screen, the cursor will always move up or down to remain on
the screen whenever the line it is presently on is scrolled off the
screen.

To obtain continuous scrolling of the screen, you may use either
of these commands along with the keyboard repeat function to
scroll the text up or down.

SCROLL ONE SCREEN PAGE UP OR DOWN

Suppose you want to move to the previous or next screen page of text. You can use the R and C keys on the keyboard.

```
            W   E   R
     CTRL  A   S   D   F
            Z   X   C
```

Note the R key is above the C key. If you want to see the screen page of text that precedes the present text displayed (this text can be imagined as being "above" the present display), enter [CTRL] R. If you want to see the text that is "below" the present display, enter [CTRL] C.

If you are using the 24-line display, one screen page is exactly 24 lines. If you are using the split display, one screen page will be 19 lines. If you are using any of the Ultraterm video modes with 24- to 48-line displays, the screen page will be equal to the the number of lines in the display format. In other words, the screen paging commands will always show the previous or next screen page of text without overlap or loss of lines.

MOVE TO TOP OR BOTTOM OF FILE

The last commands which control text positioning on the video screen involve the T and B keys.

```
            W   E   R   T
     CTRL  A   S   D   F
            Z   X   C   V   B
```

If you enter [CTRL] T, the editor will move to the top (beginning) of the text. If you enter [CTRL] B, the editor will move to the bottom (end) of the text. This pair is easy to remember (T for top and B for bottom). If there is a long file in the buffer, it will take several seconds to move from one end of the file to the other.

ENTERING TEXT FROM THE KEYBOARD

You may enter text directly from the keyboard into the file being edited. You must first position the cursor at the desired location where you want to key the text in. There are two modes of key-board entry--the insert mode and the non-insert (strike-over) mode. You can enter the [CTRL] I command to toggle between the insert and non-insert modes. The mode selected will be displayed momen-tarily at the bottom left of the screen.

KEYBOARD INSERT MODE

In the insert mode, any characters you type on the keyboard will be inserted at the cursor position. As you type additional characters, they will push the remainder of the line to the right. If the line becomes wrapped around because of the additional characters, sub-sequent lines will be pushed down.

If you type the [RETURN] key, a CR/LF will be inserted and all of the lines beyond the cursor will be pushed down one line.

To keep up with a fast typist, the screen display update is pre-empted by the display of the new characters typed in. If you type characters rapidly, the present line display will be updated but the display of the lines below will not be updated until you pause. This allows you to see immediately what is typed in without any annoying delays for screen updating.

KEYBOARD NON-INSERT (OVERSTRIKE) MODE

In the keyboard non-insert mode, any character you type will replace the existing character at the current cursor position.

DELETE CHARACTER

You can delete a character under the cursor by entering the [CTRL] G command. The remainder of the line will shift to the left to close the "hole" left by the deleted character. You may delete a CR/LF combination by placing the cursor on the "blank" space representing that combination and entering the [CTRL] G command.

This will pull up all of the lower lines. You may delete control characters also with this command.

If you delete several characters rapidly in a long line which wraps through several video lines by using the keyboard repeat function, the display of the line containing the characters being deleted will pre-empt the display of the wrapped lines until there is a pause in the command or a CR/LF is deleted. This will provide efficient display of the character delete operation without delays caused by screen updating.

DELETE LINE

The [CTRL] L command will delete the video line that the cursor is presently on. All of the lines below the cursor will move up one line and the cursor will end up at the far left of the next line.

Only one video line will be deleted by this command even if the deleted line was a long line wrapped through several video lines.

DELETE TO LINE END

The [CTRL] N command will delete the remainder of the line from the cursor position to the end of that video line. A CR/LF combination will be placed at the current cursor location.

FIND/DELETE STRING

The [CTRL] O command will find any string you specify and delete it. It can delete every occurrence of this string wherever it is found from the current cursor position to the end of the file. It can also find all of the string appearances and delete only those you wish to have removed.

When you enter this command, the program will ask you to enter the string to be deleted. The string must be 30 characters or less in length and can include any control characters except escape, control-M, control-H, or control-J. You can quit this command if you don't enter any string and just enter [RETURN].

You must enter the string in upper and lower case characters

exactly as the string you wish to delete. After you enter the
string, you will be asked to enter [RETURN] if you wish to delete
the string. After entering [RETURN], you will be asked whether
you wish to delete all occurrences of the string or only some
occurrences.

If you specify A (for All), the editor will initially display the
current screen of text. Then it will search through the file from
the current cursor position to the end of the file and delete the
string wherever it occurs. While it is doing this, it will display
the video page of text where the string was found. This will give
you some idea of the number of occurrences of the string in the
text. Although the pages where the strings are found will be dis-
played, the actual removal of the string will not be shown. When
the string search is completed, the cursor will be at the end of the
file.

If you specify S (for Some), the program will initially display
the current screen of text. Then it will search through the file
from the current cursor position to the end of the file and stop
wherever the string is found. It will display the text where the
string was found with the cursor positioned at the start of the
string. You will now have a choice of deleting the string or
leaving it undisturbed and searching for the next occurrence of
the string.

If you depress the [SPACE] key, the string will be deleted, the
display will be updated to show the deletion, and the search will
continue for the next occurrence of the string. If you depress
the [RETURN] key, the string will not be deleted and the string
search will continue. If any other key is depressed, it will be
considered as an edit command or keyboard entry and the delete
command will be cancelled.

If you wish to delete a string from the entire file, remember to
place the cursor at the beginning of the file before executing
this command. The find/delete command always starts from the
present cursor position and proceeds to the end of the file.

The find/delete command is useful in removing certain undesir-
able control characters which may appear in some text files. For

example, the ^@ null or ^G bell characters can be easily removed
from a file with a few command keystrokes.

DELETE TO BEGINNING OR END OF FILE

You can use the [CTRL] @ command to delete all of the text from
the beginning of the file up to the current cursor position or to
delete all of the text from the current cursor position to the end
of the file. Since the @ character is a shifted character, you
must simultaneously depress the [CTRL] key and the [SHIFT] key
as well as the @ key in order to enter this command.

When you enter this command, the following will be displayed:

> **DELETE**
> 1:Front of file
> 2:Rest of file
>
> 1 or 2? -->

Enter 1 to delete everything up to (but not including) the character
at the cursor or enter 2 to delete everything beyond (and including)
the character at the cursor. Enter [RETURN] if you don't want to
delete anything at all. If you select 1 or 2, you will be asked if you
are sure you want to execute this command. Enter Y (for Yes) or
N (for No).

You can use this command to isolate a block of text for later
insertion into another text file. Move the cursor to the beginning
of the desired block and delete all of the text preceding the
block. Then move the cursor just past the end of the desired
block and delete everything beyond the block. Finally, save the
block to disk.

This command is potentially dangerous because you can delete a
large portion of your file. If you want to keep the original file,
be sure you have saved it to disk before using this command.

FIND STRING

You can use the [CTRL] O command to find a string in the text.

This command will find every occurrence of the string or just the next occurrence.

After you enter the [CTRL] O command, you must enter the string. The string can include control characters (except escape, control-J, control-M, and control-H) and must be 30 characters or less in length. You must enter the string exactly as desired in upper and lower case letters followed by [RETURN]. After you enter the string followed by [RETURN], enter [ESC]. Do not enter [RETURN] a second time here because that will delete the string from the text instead of just finding it. Prompts are shown to help you select the correct key entries. If you want to quit this command, do not enter any string--just enter [RETURN].

The present screen of text will be displayed until the first occur-rence of the string after the current cursor position is found. The text containing the string will then be displayed with the cursor on the first character of the string found. To find the next occurrence of the string, depress the [SPACE] key or the [RETURN] key. If any other character is entered, it will be considered an editing com-mand or a keyboard entry and the search will be terminated.

FIND/REPLACE

You may also use the [CTRL] O command to replace a string with another string. This command will perform this for every instance where the string occurs or in selected instances. After you enter the string to be found, enter the replacement string. You will then be asked whether you want the string replaced in all instances or just in some instances.

If you answer A (for All), the current screen of text will be dis-played initially. If the string is found, the text page containing the string will be displayed, the string substitution will be made, but the string substitution will not be displayed. After the file has been searched to the end, the end of the file will be displayed.

If you answer S (for Some), the current screen will be displayed until the string is found. The screen will then show the text page where the string was found and the cursor will be positioned over

the first character in the string. If you enter [SPACE], the
substitute string will replace the string and the new string will
be displayed in place of the old string. The search will then
continue for the next occurrence of the string. If you enter
[RETURN] the string will not be replaced and the search will
continue for the next occurrence of the string. If any other key
is depressed, it will be considered a keyboard entry or edit
command and the string find/replace will be discontinued.

FORMAT CHANGE

Suppose you are using an 80-column video display and the text
in the buffer consists of brief lines significantly shorter than 80
columns in length or long lines which split words where the line
wraps around the right margin. You may wish to reform the lines
so they are closer to 80-columns in length without splitting words
at the right margin.

The [CTRL] V command will format any or all of the lines in
the text. Formatting will reform a line so it extends all the way
towards a redefined right margin without splitting a word. Any
word that might be split at the right margin is moved down to the
beginning of the next line.

You may specify any margin width from 40 to 160 columns. You
can format text for any number of columns regardless of the number
of columns in your video display. For example, if you have an 80-
column display, you can format the text into 40-, 80-, or even
160-columns. Of course the text formatted for 160 columns will
wrap around with split words when displayed on an 80-column
screen, but the same text will be properly formatted when dis-
played on a 160-column screen.

When you execute this command, you will have to enter the column
width for the new format. If you don't want to perform the format
operation, enter [RETURN]. The column width must be between 40
and 160 columns. You will next be asked if you want to format all
of the lines following the present cursor position or just some of the
lines.

If you answer A (for All), then all of the lines starting from the

line the cursor is on to the last line in the file will be re-formatted. As the re-formatting proceeds, it will be displayed on the screen. Initially, formatting will proceed slowly down the screen because the lower screen is being re-displayed after each line is formatted. However, after the last line on the display is formatted, it will move along more rapidly.

If you answer S (for Some), the cursor will remain on the present line. If you want that line formatted, depress the [SPACE] key. The line will be formatted and the cursor will move to the next line. If you don't want that line formatted, depress the [RETURN] key and the cursor will move to the next line. If you enter any other character, it will be considered a keyboard entry character or an editing command and the formatting operation will end.

If you don't want the formatting command to join the end of one paragraph with the beginning of the next paragraph, use double spacing between paragraphs in the original text.

YANK DISK FILE

You can yank a text file from disk into the text being edited by using the [CTRL] Y command. The disk text file will be inserted into the edit file at the current position of the cursor. This feature can be used to insert a block of text from another file.

After you execute this command, you will have to enter the filename or pathname of the disk text file. If you decide not to yank in a disk file, enter [RETURN]. The disk file must be a conventional text file (a binary file cannot be used).

After the disk file is inserted into the buffer, the cursor will appear at the end of the newly inserted text. If the buffer does not have enough room to completely load the disk file, it will load as much as it can until the buffer is full.

EDITOR MENU

You can display the editor menu shown in figure 7-2 in the editing mode by entering a [CTRL] Q. This is a summary of all of the editing commands. The editing mode will be resumed after you

press any key.

SPECIAL CHARACTERS

You cannot enter some special characters with the Apple][+ key-
board. The terminal mode provides for translation of control char-
acters to special characters with the keyboard translation that is set
up with the INSTALL program. However, that translation is discon-
nected in the editor because most of the control characters are used
for editing commands. If you want to insert one of these special
characters into the text, enter a [CTRL] P followed by one of the
following letters:

Letter Key	Special Character	Character (hex)
K	[	$5B
L	\	$5C
M	]	$5D
N	^	$5E
O	_	$5F
P	`	$60
Q	{	$7B
R	|	$7C
S	}	$7D
T	~	$7E
U	rub-out	$7F
V	^\	$1C
W	^]	$1D
X	^^	$1E
Y	^_	$1D

For example, you can enter a [character by typing a [CTRL] P
followed by a K. All of these special characters can be entered
directly with the //c or //e keyboard so it is not necessary to use
the [CTRL] P prefix key unless you have a][+. If you have a
keyboard enhancer on your][+, you may enter some of these special
characters directly.

The last four special characters in the list above are entered on
the //c or //e directly as control characters. These are listed

below for reference.

//c or //e Key	Special Character	Character (hex)
[CTRL] \	^\	$1C
[CTRL]]	^]	$1D
[CTRL] ^	^^	$1E
[CTRL] _	^_	$1F

CONTROL CHARACTERS

All control characters in the text except for control-M (CR) and
control-J (LF) will be shown as a circumflex or caret character
followed by the associated letter. For example, a control-H will
be displayed as ^H. When you move the cursor to a control
character, it cannot appear on the ^, but will always appear on
the associated letter. If you can place the cursor on the ^, then
the ^ is not associated with a control character, but is simply a
caret character. A control character is a single character that
takes two character spaces on the video display.

You may find several unexpected control characters in your editor
display. For example, you may find ^@ characters present. This
represents the null control character (00) which is transmitted
by some remote systems to create a delay. You can prevent this
character from being captured in your buffer as described in
chapter 5. You may delete all of these null characters from the
file by using the [CTRL] O command. When you are asked to enter
the string to delete, enter a control-@.

Some other common control characters you may find in your text
are ^G (bell), ^H (backspace), and ^I (tab). For example if you
see the following:

aple^H^Hple

It means someone had difficulty trying to type 'apple'.

Since most of the control characters are used as editing commands,

how can you enter a control character into the text being edited?
This can be accomplished by preceding the control character with
a [CTRL] P. For example, if you want to insert a control-G into
the text, enter [CTRL] P followed by [CTRL] G.

You can delete control characters by the usual method of placing
the cursor on the control character (the letter following the ^)
and using [CTRL] G to delete the control character. Since the
video display of the control character takes two character spaces,
the remainder of the line will pull in two spaces after the control
character is deleted. This is true even if the control character
display is wrapped around the right margin or wrapped into or out
of the video screen.

REPEAT KEYS

The editor uses a software keyboard buffer to store keystrokes.
This insures all keystrokes are accepted even if you type them
while some of the slower screen operations are taking place. For
example, if you want to delete eight lines of text, you can enter
[CTRL] L eight times as fast as you can and all eight commands
will be executed. However, if you use the repeat function of your
keyboard, you may enter more commands than you wanted to and
delete more lines than you wish you had. Therefore, you should
be careful about using the repeat key with delete commands.

CR/LF EXPANSION

Normally the text in the buffer has lines terminated in the CR/LF
combination. However, if you captured the text during a terminal
emulation operation, it may contain single CR and single LF char-
acters. When the editor is entered, CR or LF characters in the text
buffer will be converted in the following way:

1) CR/LF combinations will be unaltered.
2) Single CR characters will be converted to a CR/LF combination.
3) Single LF characters will be converted to a CR/LF combination.

Since a CR/LF combination takes up two characters, any text in the
buffer which contains single CR or LF characters will increase in
size. The amount of the increase depends on the number of conver-

sions of single LFs or CRs to the CR/LF combination. If the size increase results in a full buffer, an error message will be displayed.

If you want to preserve any single CR or LF characters in the capture buffer, save the text in a binary file before editing it.

VIDEO "NOISE"

Some video cards will generate a dark dash or light dot on the screen whenever a character is written to the video RAM. If only a few characters are being written, this will not be apparent. However, if a lot of characters are being written rapidly, this becomes obvious. In the editor, the entire screen is sometimes re-written even when there is just a minor change in one of the lines. For a 80X24 video format, this means 1920 characters are written to the video RAM even though the screen content is not significantly changed. This may cause a momentary burst of "video noise". During scrolling, this effect is more pronounced in the split screen modes. The Ultraterm and Apple video cards will not exhibit this characteristic.

C H A P T E R   8

M A C R O S   A N D   F U N C T I O N   K E Y S

Macros are commands which you can program in sequences to
perform most of the functions of this program. You may program
a macro sequence to perform anything from a simple task like
dialing a number to a complex task like conducting a total log-on/
access/log-off operation automatically.

Macro commands are in the form of simple text characters which
you can enter with the MODEM MGR editor and store as an
ordinary text file. In order to create these macro script files, you
should learn how to use the editor furnished with this program
or any editor which produces standard Apple text files. You may
save the macro script file to disk under any file name.

You can execute the macro script file by using the @ command
from the terminal command mode. After you enter this command,
you must enter the name of the macro script file. Enter the name
of the macro script file or enter [RETURN] if you decide not to
execute a macro file.

Here is an example of a simple macro script which can be used
with a "smart" modem:

T "555-1212"
L "CONNECT"
S "Will arrive at 5 PM"
H

This macro sequence consists of four commands which will execute
automatically from the beginning to the end. Each command is
shown on a separate line for clarity. The first command (T) will
telephone dial the number 555-1212. The second command (L) will
look for the CONNECT message from the "smart" modem which
occurs after a connection is made. The third command (S) will send
the text message and the last command (H) will hang up the phone.

If you execute this macro, it will dial the number, wait for a

connection, send the message and hang up. All of this will be
performed without any action on your part except to enter the
@ command and macro script file name.

The macro example shown above consists of four text lines. You
can enter these lines with the editor and save them to a disk
file. This macro could also be created in the following format:

T"555-1212":L"CONNECT":S"Will arrive at 5 PM":H

This macro sequence does exactly the same thing as the sequence
shown earlier. You may use the colon to separate different com-
mands and you may remove unnecessary spaces.

MACRO SCRIPT FILE LENGTH

A DOS 3.3 macro script file must not exceed 512 characters and a
ProDOS macro script file must not exceed 510 characters. If more
space is required, you can use a macro command to execute another
macro script file. By chaining several macro script files in series,
you can handle a macro sequence which is limited only by your
disk capacity.

Since the CR/LF combination at the end of each line uses two
characters, you can save some file space by using a colon (which
is only one character) between macro commands instead of placing
each command on a separate line. You can also save space by
placing the delimited string immediately after the command letter.
Many of the examples shown have a space between the command
letter and the delimited string for clarity, but it is more efficient
to eliminate any unnecessary characters.

Although comments are allowed in a macro file, they should be
used sparingly to conserve space.

The null character (00) can be used in DOS 3.3 macro script files,
but should not be used in ProDOS macro script files.

MACRO LETTER COMMANDS

If you inspect the macro example presented earlier, it will show

you each macro command consists of a single letter. (For example, T, L, S, H). The macro command letter must be the first character at the start of a new line or the first character after the colon which separates commands. If the first character is not a macro command letter, the remaining characters will be ignored until the next line or colon.

MACRO STRINGS

Most of the macro commands in the example shown earlier are followed by a character string delimited by quotation marks. The macro string delimiters can be quotation marks (""), apostrophes (''), or less-than/greater-than characters (<>). For example, all of the following macro commands are the same:

L "CONNECT"
L 'CONNECT'
L <CONNECT>

The delimited string must not contain the delimiter. For example do not use the following string:

L 'CHARLEY'S AUNT'

Instead of looking for CHARLEY'S AUNT, this macro will look for CHARLEY. Use the following macro instead:

L "CHARLEY'S AUNT"

The <> delimiters have a special function when used with the L, R, or S macro commands. The following comments apply only to L, R, or S macro command strings enclosed by the <> delimiter. If an exclamation point (!) character appears in the string, it will be treated as a CR character. If a percent (%) character appears in the string, it will be treated as a LF character. See examples in the sections describing the L and S macro commands.

The <> delimiters also have the following special significance when used with the macro S command. If the first character in the string is a # character, this character will not be sent, but the remaining characters in that string will be sent at a slow trans-

mission speed. All subsequent strings will revert back to the normal (fastest) transmission rate. See examples in the section describing the S macro command.

You may use a colon (:) in a macro string. The macro string can also include control characters. If you are using the editor furnished with this program, use the control-P editing command to put control characters into the string. For example, if you want to enter a macro to send a control-G character, use the following six keystrokes in the editor:

1) S
2) "
3) [CTRL] P
4) [CTRL] G
5) "
6) [RETURN]

This will be displayed on the screen as follows:

S"^G"

Since the editor does not allow Control-J (LF) or Control-M (CR) to be inserted within a line, use the ! or % characters with the <> delimiters as described earlier if you want to send a CR or LF character.

NUMERICAL LABELS

Numbers from 0 to 9 can be used as labels at the start of a new line or immediately after the colon which separates commands. These labels are not commands and are ignored by most macro commands. They are used with the G (go to) macro command which allows a jump from one place in the command sequence to another place marked by a numerical label.

The labels do not have to be in numerical sequence. In fact, the number selected for the label determines the maximum number of times that label can be accessed through the G (go to) macro command.

The "0" numerical label has a special characteristic. It is used to mark the macro command the program will execute whenever a timeout occurs. It also marks where execution will resume if the G (go to) command to a particular label has been performed more than the allowed number of times.

The next example uses numerical labels 0 and 3.

```
T"555-1212"
L"CONNECT":S"Send more money"
3:V"^G":Z"1":G"3"
0:H:Q
```

This macro is for a "smart" modem. The first macro command line will dial the number. The second line will look for the CONNECT message from the "smart" modem. If a connection is made, the "Send more money" message will be sent.

The label 3 on the third line will be ignored initially. The V"^G" command will beep the speaker and the Z"1" command will pause for one second. The G"3" command will cause a jump to the label 3 at the beginning of the same line. The speaker will be beeped again. After three repeats, the G"3" command will no longer go to numerical label 3, but will go to numerical label 0. This label is on the last line with the H and Q macro commands which will hangup and quit (end) the macro. Essentially, the last two macro command lines will beep the speaker four times (once plus three repeats) at one second intervals.

What happens if no connection occurs and the "CONNECT" is never received? The macro will time out and jump to label 0 where it will hangup and quit. The speaker beeping will not occur.

More information on these labels will be provided in the description of the G macro command.

MACRO COMMENTS

You may place comments in a macro script file as reminders of what the macro file or a particular command does. You can read the comments when you view or edit the file.

If the first letter in a new line or after a colon is not a macro command letter, the remainder (until the next colon or CR/LF) will be ignored and can be used as a comment line. You may also place comments after the delimited string or between the macro command letter and the delimited string.

Comments placed directly after the macro command letter must not contain any of the delimiters listed earlier. Comments must not use the colon (:) character. Comments use up file space so they should be used sparingly. Some examples of comments are shown below.

L passwo"rd"
T "555-1212" acme realty co
  stock market macro

The last line is a comment line because it is preceded by a non-macro command letter (the space character). If you wish to have comments appear on the video screen while the macro is being executed, use the V macro command described later.

MACRO ERROR MESSAGES

If you enter an erroneous string with a macro command, you will see the following type of error message:

x MACRO ERR --> yyyy

The "x" represents the macro command and the "yyyy" represents the string. For example, if the macro command is G "9", which means go to label 9, and label 9 does not exist, the following error message will appear:

G MACRO ERR --> 9

The macro sequence will not terminate when an error occurs. The command with the error will be skipped and the next macro command will be executed.

MACRO COMMANDS

A description of all of the macro commands is presented below.
Some of these commands are similar to the commands which you
can enter directly in the terminal command mode. In these cases,
the macro command letter is the same as the letter used for the
direct command. Many of these commands must be followed by
a character or string delimited by "", ", or <>. In the description
below, the "" delimiters are used in the examples, but any of the
other delimiters can be used.

Your system might not support all of these commands. For example,
if you do not have a clock card installed, the K macro command
will not function.

A:AUTO SAVE BUFFER

       A "1"   Turn auto-save on
       A "0"   Turn auto-save off

The A macro command will turn the capture buffer auto-save
feature on or off. If you do not set auto-save on and the capture
buffer becomes full, the buffer will be set off and no further text
will be captured. If you set auto-save on, the buffer contents will
be saved to disk with the file name SAVED.x where x is initially
the letter A. After the disk save, the buffer will be cleared to
capture additional text. If XON/XOFF is enabled, XOFF will
be sent before the disk save and XON will be sent after the disk
save.

B:BUFFER ON/OFF

       B "1"   Set capture buffer on
       B "0"   Set capture buffer off

The B macro command will set the capture buffer on or off.

C:CLEAR BUFFER

       C   Clear capture buffer

The C macro command will clear the capture buffer. No string is required with this command.

D:DISK SAVE

    D "filename" or
    D "pathname"

The D macro command will save the capture buffer to a disk file. The macro command D "filename" or D "pathname" will save the buffer to a file called "filename" or "pathname" on the currently active disk. The buffer will not be automatically cleared after the file has been saved to disk. (Use the C macro command if you wish to clear the buffer). If you have enabled XON/XOFF, XOFF will be sent before the disk save and XON will be sent after the disk save.

E:EMULATION ON/OFF

    E "1"   Enable emulation
    E "0"   Disable emulation

The E macro command will enable an emulation if that emulation file was loaded. (See the N macro command).

F:FULL/HALF DUPLEX

    F "F"   Switch to full duplex
    F "H"   Switch to half duplex

The F macro command will switch to full or half duplex.

G:GO TO NUMERICAL LABEL (DECREMENTED COUNT)

    G "n"   Go to label n (n = 0 to 9)

The G macro command will go to the numerical label specified in the delimited string. The label can be any number from 0 to 9. For example, the macro command G "3" will jump to the numerical label 3 and resume macro command execution at that point. If the numerical label is not found, an error message will be displayed

and the next following macro command will be executed.

If this command is part of a loop, it may be executed several times. However, the numerical value of the labels 1 through 9 also defines the maximum number of times this jump command can be executed. After the maximum is exceeded, the next macro command to be executed will be the command after the numerical label 0 instead of the specified numerical label.

The following macro illustrates this decremented counting limit.

```
3:S"^G"
G"3"
0:Q
```

This macro will start by executing the first line which sends a control-G (bell) character. The G"3" command in the second line will cause a jump to the first line and the same character will be repeated. This will be repeated two more times for a total of three repeats. After the third repeat, the macro will jump to numerical label 0 and quit. The bell character will be sent a total of four times (once at the start plus three repeats).

After a numerical label has been jumped to the maximum number of times, it can never be accessed again with the G macro command. The only exception is the numerical label 0 which can be accessed an unlimited number of times.

If the numerical label 0 is not used in a macro file, its presence is implied at the end of the file. That is, a G "0" will terminate the macro if label 0 is not assigned anywhere.

H:HANGUP

      H   Hangup

The H macro command will hangup the phone connection.

I:INSERT LF

I "1"	Insert line feeds
I "0"	Do not insert line feeds

The I macro command will enable or disable the automatic insertion of a line feed character after each CR character sent.

J:PARITY/LENGTH

J "n"	Set comm parameters

The J macro command will select the word length, parity, and number of stop bits. This macro command must be followed by a delimited number which corresponds to the number associated with the data word parameters desired. These parameters are listed when the J command is executed in the terminal mode. For example, in many cases the J command in the terminal mode will show a list of parameters which may include the following:

        6)8+1+none

In this example, you would use the J "6" macro command to select 8 data words with one stop bit and no parity.

K:KLOCK TIME

K "time"	Wait for time set

The K macro command will specify the time to wait for before executing the next macro command. This is useful in delaying the start of a macro until a designated time.

You must have a clock card which has been installed with the INSTALL program in order to use this macro command. You do not need to enable the clock or time-of-day display. To specify the time, you may use any one of the following formats:

K "01:35 PM"
K "1:35 PM"
K "1:35 pm"

K "12:15 am"
K "12:15AM"

You must specify AM, PM, am, or pm. This may be preceded by
a space. There must be an hour number in the range of 01 to 12
followed by a colon followed by a minute number in the range of
00 to 59. (No spaces allowed). Remember that 11:59 is followed by
12:00 and 12:59 is followed by 1:00. The zero hour is not recognized
as a substitute for the 12th hour. If an error is made in defining
the time, the macro sequence will terminate.

When the macro clock command is in effect, you may quit this
command and skip to the next macro command by pressing any key
except the escape key.

L:LOOK FOR STRING

L "string"	Look for specified string
L	Look for any character

The L macro command will look for the specified string. It will
wait until the string has been received before continuing to the
next macro command. For example, L "HI" will wait until the
string HI has been received. The string must be exactly as defined.
In this example, the string hi will not be recognized because the
lower case letters do not match the specified string. When this
command is in effect, you may quit this command and skip to the
next macro command by pressing any key except the escape key. If
no string is specified, the command will look for any received char-
acter. If the <> delimiters are used, the following substitutions will
be made in the string:

> ! will be treated as a CR
> % will be treated as a LF

The following are some examples:

L	Look for any character
L "HI!"	Look for HI!
L <HI!>	Look for HI followed by CR
L 'HI%'	Look for HI%

```
L <HI%>          Look for HI followed by LF
L "HI!%"         Look for HI!%
L <HI!%>         Look for HI followed by CR and LF
L <!>            Look for CR
L <%>            Look for LF
L "!":L <!>      Look for ! then look for CR
```

This command is useful in situations where you must wait for a
prompt or query from the other system before responding. By
specifying the required prompt with the L macro command, your
system will wait until it is received before responding. For
example, if you must log into a system by supplying a password
after the other system sends "Enter password:", you can use the
following macro:

```
L "Enter password:"
S <ROSEBUD!>
```

You may shorten the first line to any of the following forms:

```
L "word:"
L "d:"
L ":"
```

Use as long a string as necessary to avoid conflicts with other text
which may be received.

If you expect a string to be received more than once and you don't
want to proceed the first time it is received, you can use the same
L macro command several times. For example, suppose you expect
to receive the following message:

"You need a password for this system. Enter your password"

You want to ignore the first "password" string which is received,
but you want to respond when this string is received the second
time. Use the following macro sequence:

```
L "password"
L "password"
S <ROSEBUD!>
```

Or to reduce space, use the following:

L"rd":L"rd":S<ROSEBUD!>

The password will be sent after the second "password" string is received.

The L macro command is also useful in using "smart" modem messages to determine modem status changes. For example, any one of the following macro commands can be used to determine when a connection has been made:

L "CONNECT"
L "ECT"
L "T"

The receiver control input on your serial card must be "high" to receive the CONNECT message from a "smart" modem. If you are using carrier control, the messages sent by the modem might not be received until a remote carrier has been detected.

In the case of non-smart internal plug-in modems, the MODEM MGR program generates the modem messages (CONNECT, NO CARRIER, RING, etc). Since these messages are self-generated and are not received from an external source, the messages cannot be used with the L macro command. However, when a connection is made with these modems, a LF character is inserted into the input buffer so the following macro command can be used with non-smart internal modems to recognize a connection has been made.

L <%>

See the U macro command for another way of detecting a connection when carrier control is enabled.

Try to avoid specifying a string which has a double prefix or double letters at the beginning. If the matching string is received with a triple prefix or triple letters, the string will not be recognized. For example, if the macro command is L "coconut" and the string "cococonut" is received, it will not be recognized as a matching string. If the macro command is L "RR tracks" and the string

"RRR tracks" is received, it will not be recognized as a match. Although it is unlikely that a triple prefix word will be received that matches a specified double prefix word, it is recommended you avoid the use of double-prefix strings.

If the string is not received within a defined time period, time-out will occur and the next macro to be executed will be the one following the label 0. If a label 0 does not exist, the macro sequence will terminate. The macro timeout period can be set by executing the INSTALL program.

M:MODEM BAUD RATE

> M "X"   Set modem baud rate

The M macro command will set the baud rate for the modem and serial card (if used) within the range of baud rate settings available. This macro command must be followed by a delimited letter which corresponds to the letter associated with the baud rate desired. These letters and their associated baud rates are listed when the M command is executed in the terminal mode. For example, the M command in the terminal mode may show the following list of baud rates:

> A:High speed
> B:Low speed

In this example, you would use the M "A" macro command to select the high speed baud rate. In other cases, you may see the following rates listed when the M command is executed in the terminal mode:

> A:50
> B:75
> C:110
> D:135
> E:150
> F:300
> etc.

If you wanted to use a macro to select the baud rate of 300 baud, you would use the M "F" macro command.

N:NEW EMULATION FILE

N "filename" or
N "pathname"

The N macro command will load the emulation file specified in the
string following this command. For example, the macro command
N "D200" will load the emulation file with the file name D200.EMU.
For DOS 3.3, the emulation file must be on the work disk used to
start the program.

O:ORIGINATE TO ANSWER

O   Switch to answer mode

The O macro command will switch the modem from the originate
mode to the answer mode. To enter the originate mode, see the T
macro command.

P:PRINTER ON/OFF

P "1"   Enable printing
P "0"   Disable printing

The P macro command will enable or disable printing.

Q:QUIT MACRO

Q   Quit macro

The Q macro command will terminate the macro. All macros will
also terminate automatically at the end of the last command in the
macro file.

R:CONDITIONAL SKIP

R "ab"   Look for a or b
R   Look for any character

The R macro command looks for a match with either one of two
specified characters. The form of this command is R "ab" where

a and b represent two different characters. If the first character
(a) is received first, the macro execution will proceed to the next
macro command on the same line. If the second character (b) is
received first, the macro execution will skip to the start of the
next line in the macro file. The next macro instruction executed
is dependent on which character is received first.

The following is an example of the use of this conditional macro.

```
3:T"555-1212"
R"TY":V"^G":Q
H:Z"9":Z"9":Z"9":G"3"
0:H:Q
```

Suppose you have a "smart" modem which will issue a CONNECT
or BUSY status message if the appropriate condition exists. The
first macro command will dial the number. (Ignore the numerical
label 3 for now). The R"TY" command in the second line will look
for a T character or a Y character. If the "smart" modem sends
the CONNECT message, the T character will be recognized and the
remainder of that command line will be executed. (The remaining
commands on that line will beep the speaker and quit the macro).
If the "smart" modem sends the BUSY message, the Y character will
be recognized, and the next command line will be executed. (The
beeping of the speaker and quitting will not be executed). The next
and subsequent commands will cause hangup and a 27 second pause
before going to the beginning of the macro to repeat it all over
again.

Essentially this macro will dial a number and if a connection is
made, it will beep the speaker so the user will be aware of the
successful connection. If the line is busy, the macro will pause
for 27 seconds and try again. After 3 retries, it will quit.

If neither character is received within a set time period, timeout
will occur and the entire macro sequence will terminate. The macro
timeout period can be set by executing the INSTALL program.

If a string is not specified after the R macro command, the program
will wait for up to approximately one second for the next character
to be received. If a character is not received within approximately

one second, the macro execution will proceed to the next macro command on the same line. If a character is received within approximately one second, the macro execution will skip to the start of the next line in the macro.

The following is an example of the use of this R conditional macro without a string.

9:S<!>
R:G"9"
V"^G"

The first line will send a CR character. In the second line, the program will wait for a response from the other system. If nothing is received within one second, the G"9" command will result in a jump to the first line to send a CR character again. This will be repeated up to 9 times before it quits. If a character is received, the last line will be executed (the speaker will be beeped).

This is an example of using a macro to log into a system which requires a CR character to initiate the log-in process, but does not always reliably recognize the CR character until it has been sent a few times.

S:SEND STRING

      S "string"   Send string

The S macro command will send the delimited string which follows the command. If the <> delimiters are used, the following substitutions will be made in the string:

      ! will send a CR character instead
      % will send a LF character instead

Some examples are shown on the next page.

S "HI!"	Send HI!
S <HI!>	Send HI followed by CR
S 'HI%'	Send HI%
S <HI%>	Send HI followed by LF
S "HI!%"	Send HI!%
S <HI!%>	Send HI followed by CR and LF
S <!>	Send CR
S <%>	Send LF
S "!":S <!>	Send ! followed by CR

Also, if the <> delimiters are used and the first character is a #
character, the # character will not be transmitted, but all remain-
ing characters in the string will be sent at a slow rate. It is a good
idea to use the <> delimiters with the initial # character for systems
which cannot receive characters at the maximum rate. Some exam-
ples are shown below.

S "HI"	Send HI at normal speed
S <HI>	Send HI at normal speed
S "#HI"	Send #HI at normal speed
S <#HI>	Send HI at slow speed
S <#HI!>	Send HI and CR at slow speed
S<#HI>:S"BYE"	Send HI at slow speed and send BYE at normal speed

If the string sending command is the last macro command in a script
file and the other system is echoing your characters, you may find
the MACRO END message appears before the string is completely
echoed. For example, if the last macro command is S<OFF!>, you
may see the following:

OF
MACRO END
F

If this bothers you, use the following command sequence:

S<OFF!>
L<!>

This will send the OFF string and look for the echoed CR character

before ending the macro. Another solution is to use:

S<OFF!>
Z"1"

This will send the OFF string and pause for one second before ending the macro.

T:TELEPHONE DIAL

> T "string"   Telephone dial

The T macro command is the same as the T command in the terminal command mode. It dials the number in the delimited string which follows this command. If no string is supplied, the modem will be switched to the originate mode. The following are some example commands:

T "T555-1212"	Tone dial 555-1212.
T "P555-1212"	Pulse dial 555-1212.
T "P9,T555-1212"	Pulse dial 9, delay 2 seconds, tone dial 555-1212.
T "Z"	Redial last number dialed.
T "D"	Dial default number.
T	Go to originate mode.

U:USE CARRIER CONTROL

> U "1"   Use carrier control
> U "0"   Don't use carrier control

The U macro command can be used to check for the presence of a carrier before proceeding. It can also be used to terminate a macro sequence if a detected carrier is lost. Carrier detection is one way to determine if a connection has been made. You must have carrier control in order to use this macro.

The U "1" command will suspend further macro command execution until a carrier is detected. After the carrier is detected, the next macro instruction will be executed. If the carrier is subsequently lost, the macro sequence will terminate. The U "0" command will

Note the U "0" command is used to turn off the carrier checking after the initial carrier presence is detected. This will allow all of the macro commands to be executed even if the carrier is lost

D "STOCK FILE"
H
L "End of quotes"
S <Send stock quotes>
U "0"
U "1"
T "555-1212"
C
B "1"

command to hangup the phone. Another way is shown below.

There are two ways you can avoid this problem. One way is to use the D macro command to save the file before using the H macro

cause loss of carrier and the macro sequence will be terminated.

cuted to save the buffer to a disk file, the hangup operation will the phone. However, before the last macro command can be exe- stock quotes and after the quotes have been received, it will hangup which indicates a connection has been made. It will then ask for ber is dialed, the U "1" command will look for carrier detection After the capture buffer is enabled and cleared and the phone num-

D "STOCK FILE"
H
L "End of quotes"
S <Send stock quotes>
U "1"
T "555-1212"
C
B "1"

is a bug in the following macro sequence: plete all desired operations before this happens. For example, there after the carrier is lost when a call is completed. Be sure to com- If the U "1" command is used, the macro sequence will terminate

disable carrier checking under macro control.

after hangup.

V:VIEW MESSAGE

>   V "string"   View string on video screen

The V macro command will print the delimited string on your video screen. The string must be 32 characters or less in length. If you want to put messages on the screen to indicate which macro instruction is currently being executed, this is one way to provide a running status report. The following are examples:

V "Stock market macro"
V "Chaining to next macro"
V "^G"

The last example will beep your speaker. (The delimited character is a control-G). Since these messages can use up a lot of character space, you should use them sparingly. Usually there are status messages issued with each macro command so additional comments are not necessary.

W:WAIT FOR CALL

>   W   Wait for phone call

The W macro command will set your system ready to answer a phone call. When a call is received, your system will answer the call in the answer mode. There is no timeout on this macro. To terminate the macro, press the [ESC] key. With a "smart" modem, do not use the L"CONNECT" command after the W command because the W command will do this.

X:XON/XOFF

>   X "1"   Enable XON/XOFF handshaking
>   X "0"   Disable XON/XOFF handshaking

The X macro command will enable or disable XON/XOFF. If the other system responds to XON and XOFF, you may wish to use this command to enable XON/XOFF for flow control.

Y:SEND DISK FILE

Y "filename"   Send disk text file
or Y "pathname"

The Y macro command will transmit the disk text file specified by the file name. For example, the following macro command will send the disk file called MYFILE:

Y "MYFILE"

Z:DELAY

Z "n"   Delay n seconds

The Z macro command will pause approximately for the number of seconds specified. The number of seconds can be from 0 to 9. If no number is specified, the delay will be 1/4 second. Longer delay times can be achieved by using the letters A through Z, although the delay times will less accurate. The following are some examples of this macro command:

Z   Pause 1/4 second
Z:Z   Pause 1/2 second
Z "1"   Pause 1 second
Z "8"   Pause 8 seconds
Z "A"   Pause 17 seconds
Z "Z"   Pause 42 seconds

All times are approximate. Although the macro execution will be suspended, any characters received during the pause will be displayed and captured (if the capture buffer is enabled).

@:EXECUTE ANOTHER MACRO

@ "filename"   Exec another macro script file
or @ "pathname"

The @ macro command will load and execute another macro script file. This command allows macro files to be chained so a long macro sequence which exceeds the 512 (DOS 3.3) or 510 (ProDOS)

byte limit per macro script file can be handled. Each macro script file executed will be essentially a brand new macro sequence and the previous macro sequence which loaded it will no longer exist. Therefore, you cannot use a G macro command to jump back to a numerical label in a previous macro file.

The following is an example of the @ macro command used with a "smart" modem.

```
3:T"555-1212"
R"TY":@"STOCKS.MACRO"
H:G"3"
```

After dialing the number, the macro R command looks for a CONNECT or BUSY status message from the modem. If the T from CONNECT is received, it will load and execute the macro script file called STOCKS.MACRO. If the Y from BUSY is received, it will hangup and repeat the macro sequence up to three more times before quitting.

MACRO TERMINATION

A macro command sequence will terminate if any of the following occurs:

1) There are no more macro commands in the sequence.
2) A quit (Q) macro command is executed.
3) A timeout occurs and there is no label 0.
4) Carrier is lost when carrier checking is in effect (U"1").
5) You have set the wrong time with the clock (K) macro command.
6) A disk error occurs.
7) You type the [ESC] key or whichever key you have defined
 as the command key.

FUNCTION KEYS

You can pre-program the keyboard numerical keys from 1 through 9 to provide special functions. The functions you assign to each key can be a simple function like sending a special character. It can also be a complex function like an entire log-on/access/log-off operation.

You define the functions by assigning programmed macro sequences
to the number keys. These macro sequences are similar to those used
with macro script files. The major difference is all of the function
key macros are loaded from one disk file and each one can be sub-
sequently executed by using one of the function keys. To program
a function key, you should be familiar with the macro commands.

A function key file is an ordinary text file which you can create
with the editor. The macro sequence which is assigned to a func-
tion key must be entirely on one continuous line. If there is more
than one macro command on a line, the commands must be separated
by a colon (:) character. The first two characters in each function
key line must be the number of the function key followed by an
equal sign (=). The remainder of the line is the macro command
or sequence in the same format as the macro commands described
earlier.

A DOS 3.3 function key file must be no more than 512 characters
in length and a ProDOS function key file must be no more than 510
characters in length.

An example of a function key file is shown below.

```
1=S "{"
2=S "}"
6=T"555-1212":L"CONNECT":L"Password?":S<ROSEBUD!>
```

This function key file defines three function keys corresponding to
the numerical keys 1, 2, and 6. Each key is defined by its number
followed by an equal sign (=) followed by the macro sequence to be
assigned to that function key.

Suppose you have loaded this function key file. If you enter [ESC] 1
in the terminal mode, the { character will be sent. If you enter
[ESC] 2, the } character will be sent. If you enter [ESC] 6, the func-
tion key macro sequence will dial the number, wait for a connection,
and send the password when prompted.

All of the function keys do not have to be defined. In the example
above, there are no functions assigned to keys 3, 4, 5, 7, 8, and 9.

You can load a function key file by using the [ESC] 0 command in the terminal command mode. If no function key file is loaded, a NO FUNCTION KEY FILE message will be displayed. If a function key file is already loaded, its contents will be displayed. The following messages will then be displayed:

> NEW FUNCTION KEY FILE
> Filename? -->

If you don't want to load a new function key file, enter [RETURN]. If you want to load a file, enter the name of the function key file. If the file is longer than 512 characters (DOS 3.3) or 510 characters (ProDOS), a FILE TOO LONG message will be displayed and the file will be partially loaded. If you load a new file, any existing function key definitions will be lost.

You may also use the function keys to manage your macro script files. Suppose you have macro script files named COMPUSERVE, SOURCE, DELPHI, and DOWJONES which provide automatic log-on. You can create the following function key file which will log you on to any of these systems with just a few keystrokes.

1=@"SOURCE"
2=@"COMPUSERVE"
3=@"DELPHI"
4=@"DOWJONES"

Since the function key file is an ordinary text file which you can display by using the [ESC] 0 command in the terminal command mode, this feature can be used for other purposes. You may create a reminder or help file and load it as a function key file. Whenever you want to refer to this file, enter [ESC] 0 and the contents of this file will be displayed on your video screen. Since this file is not being used to define function keys, avoid the use of an equal sign (=) in the file.

AUTO-LOAD MACRO OR FUNCTION KEY FILE

You can have a macro script file or function key file automatically loaded whenever you start the MODEM MGR program. If you name the macro script file BTMAC.FILE and place it on the work

disk, it will be automatically loaded and executed when the program is started. If you name the function key file FK.FILE and place it on the work disk, it will also be automatically loaded when the program is started.

MACRO PROBLEMS

What can go wrong with macros? Everything!! Macros are programmed to follow expected prompts and status messages in a specific order. These must be defined exactly as they are expected to be received. You should always test a macro file under the actual operating conditions before using it regularly. Preparing a macro file is like writing a computer program. A minor typographical error or mis-spelling can cause a fatal malfunction of the program.

Here is a list of potential causes of problems when you use macros to connect to another host system:

1) The modem is set to the wrong baud rate.
2) The modem mis-identifies a valid connection as a BUSY or NO CARRIER.
3) The modem mis-identifies a BUSY or NO CONNECT as a valid connection.
4) Someone answers the phone instead of the modem.
5) Noise on the phone lines causes a prompt or reply to be garbled.
6) Although a valid connection occurs, the host is busy.
7) The host sends you a special message instead of the usual expected message.
8) Your transmissions are sent too soon or too fast.
9) When a macro accesses a disk drive, it accesses the wrong drive, slot, or prefix.
10) Your modem refuses to hang up.

MACRO EXAMPLES

Some useful macro sequences will now be described for use with currently popular information systems. Since these are based on present system prompts and menus, future system changes may render these non-operational. However, they are useful as examples which you can modify to fit your needs.

It may be possible you can use these macros directly by inserting
your password and phone number instead of those used in the
examples. However, it is recommended you prepare your own
macro files to suit your particular needs. One way to prepare a
macro file is to do a manual operation with the capture buffer
enabled. Then, save the buffer to a disk file so you can refer to the
file as a record of all of the system prompts and replies required.
After preparing the macro file, you should execute it several times
to be sure it works properly.

LOGGING ON SOURCE VIA TELENET NETWORK

Suppose your SOURCE account number is ABC123, your password is
BOO, your local Telenet phone number is 558-7078, and the Source
Telenet code is C 30124. After the connection is made, you have to
send the CR character twice. You will then receive a "Terminal="
message. You must send a "D1" followed by a CR. You will then
receive a "@" character. You must then send your Telenet code
followed by CR. After the ">" prompt is received, you must send
"ID" followed by your account number and password. The follow-
ing example shows a macro which accomplishes this with a "smart"
modem. The comments in the right column explain each macro
command; these comments should not be included in the macro
file.

B"1":C	Turn capture buffer on and clear it
T"T558-7078"	Tone dial the number
L"ECT"	Look for "CONNECT"
Z"5"	Pause 5 seconds
S<!>	Send CR
Z"1"	Pause 1 second
S<!>	Send CR again
L"="	Look for "Terminal="
S<#D1!>	Send "D1" and CR (slow)
L"@"	Look for "@"
S<#C 30124!>	Send code and CR (slow)
L">"	Look for ">"
S<#ID ABC123 BOO!>	Send your ID and CR (slow)

If your modem does not support tone dialing, remove the T from the
phone number string. If you have a non-smart external modem with
carrier control enabled, use the U"1" command instead of the L"ECT"
command. If you have a non-smart internal plug-in modem, use the
L<%> command if carrier control is disabled or use the U"1" com-
mand if carrier control is enabled instead of the L"ECT" command.

The timing used in sending the initial two CR characters is some-
times critical. A five second pause is used in this example before
sending the first CR. If the CR is sent immediately after the con-
nection is made, it may be missed. In some cases, you may have to
use a longer delay. In other cases, you may have to remove the one-

second pause between the transmission of the two CR characters. Experiment with the timing to find the most reliable log-in sequence.

LOGGING ON COMPUSERVE VIA COMPUSERVE NETWORK

Suppose your Compuserve User ID is 76003,5, your password is BOO, and your local Compuserve phone number is 520-9733. After the connection is made, you must send a control-C character. The reply will be a "User ID:" message. You must then send your user ID followed by a CR. After the "Password:" message appears, you must send your password followed by a CR. This completes the log-in operation. The following example shows a macro which accomplishes this with a "smart" modem.

B"1":C	Turn capture buffer on and clear it
T"T520-9733"	Tone dial the number
L"ECT"	Look for "CONNECT"
Z"5"	Pause for 5 seconds
S"^C"	Send control-C
L"ID:"	Look for "User ID:"
S<#76003,5!>	Send ID and CR (slow)
L"rd:"	Look for "Password:"
S<#BOO!>	Send password and CR (slow)

In the S"^C" macro command above, the delimited string is not a "^" character followed by a "C" character, but is a single control-C character. Refer to the discussion in Chapter 7 on entering control characters into text with the editor.

The timing used in sending the initial control-C character is sometimes critical. A five second pause is used in this example before sending it. If the control-C is sent immediately after the connection is made, it may be missed and the remainder of the macro will not be executed. You may have to use a longer delay.

LOGGING ON COMPUSERVE VIA TYMNET NETWORK

Suppose your Compuserve User ID is 76003,5, your password is BOO, your local Tymnet phone number is 756-8341, and the Compuserve Tymnet code is CIS02. After the connection is made, the network will send you a "please type your terminal identifier" message at 300

baud. This message will be displayed normally if you are operating
at 300 baud. If you are operating at 1200 or 2400 baud you may
see nothing at all, or you may see a string of garbled characters.
After receiving the message (garbled or otherwise), you must send
the "A" character alone with no CR. You will receive a "please log
in:" message. You must send the Compuserve Tymnet code followed
by CR. After the "User ID:" message appears, you must send
your user ID followed by a CR. After the "Password:" message
appears, you must send your password followed by a CR. This
completes the log-in operation. The following example shows a
macro which accomplishes this with a "smart" modem at 1200 or
2400 baud.

B"1":C	Enable buffer and clear it
T"T756-8341"	Tone dial the number
L"ECT"	Look for "CONNECT"
Z"5"	Pause 5 seconds
S"A"	Send A
L"in:"	Look for "please log in:"
S<#CISO2!>	Send code and CR (slow)
L"ID:"	Look for "User ID:"
S<#76003,5!>	Send ID and CR (slow)
L"rd:"	Look for "Password:"
S<#BOO!>	Send password and CR (slow)

The 5 second pause allows the "please type your terminal identifier"
transmission before sending the "A" character. You will not see this
message if you are not operating at 300 baud. If you are logging in
at 300 baud, use the L"ier" macro command to key off the last por-
tion of the message instead of using the Z"5" macro command.

DIFFICULT LOG-IN

The most critical macro command is often the one which signals the
host you are trying to get online. In the previous examples, this
usually involved the sending of a control-C or two CR characters.
If the result of this macro command is not recognized, your log-in
attempt will not be successful and the remainder of the macro will
be useless. If you are experiencing problems, you might try the
method illustrated in the following example:

```
T"558-7078"
L"CONNECT"
Z"5"
9:S<!>:Z:S<!>
R:G"9"
L"="
```

This example is for logging on the SOURCE via the Telenet network. After the connection is made, the fourth command line will send two CR characters 1/4 second apart. The R command will look for a response within one second. If nothing is received, the G"9" command will go back to the fourth line and the two CR characters will be sent again. This will be repeated up to 9 more times before quitting. If a response is received, the remainder of the log-in process (L"=") will be executed.

Additional delays before, between, and after the two CR characters should not be used because if the response from the host occurs during these delays the R command will not see it.

SAMPLE MACROS

The following examples are provided to show other tasks which can be done with macros. Study each example to obtain some ideas to help you create your own macro files.

Set Promodem Clock - This macro prompts you to enter the date and time to set the clock in the Prometheus ProModem 1200 and 1200A. Enter the information after the "MACRO END" message appears. The last Z"1" command allows the modem command echo to be displayed before the "ENTER..." message.

```
Z"1"
S"+++"
Z"1"
S"AT@T="
Z"1"
V"ENTER MM/DD/hh/mmX"
```

Read Promodem Clock - The following macro retrieves the date and
time from the Prometheus ProModem 1200 or 1200A clock. The Z"3"
command at the end allows the date and time to be displayed com-
pletely before the "MACRO END" message.

```
Z"1"
S"+++"
Z"1"
S<AT@T!>
Z"3"
```

Log Into Call-Back System - For security, you must furnish some
systems with your phone number when you sign up for system priv-
ileges. Whenever you log in, the system will direct you to hang up
so it can call you back. The following macro will handle this log-in
sequence. After the initial log-in, the H and W commands will hang-
up and wait for the call.

```
T"555-1212"
L"CONNECT"
Z"3"
S<!>
L"Enter password"
S<W6OU!>
L"Please hang up"
H
W
Z"3"
S<!>
```

C H A P T E R   9

F I L E   T R A N S F E R

The transfer mode lets you send text from your buffer or the con-
tents of a disk file to another system. Three types of file transfers
are supported by MODEM MGR.

1) The non-protocol transfer method will send text from one system
to another without error detection or correction. There are several
pacing (throttle) options provided for this type of transfer.

2) The universal XMODEM protocol transfer will send or receive
disk files with error detection and correction.

3) A special MMGR protocol transfer will send or receive any type
of DOS 3.3 or ProDOS disk file with error detection and correc-
tion. The MMGR protocol transfer also handles random-access
files efficiently.

To perform transfers, you must switch from the terminal command
mode to the transfer mode. A summary of the commands to enter
or exit the transfer mode is shown below.

      TERMINAL   ---Y--->   TRANSFER
        MODE   <--QY---   MODE

Use the Y command to enter the transfer mode from the terminal
command mode. After a few seconds of disk activity, you will be
in the transfer mode and the following prompt will be displayed:

        Xfer command? -->

You may return to the terminal mode by entering Q (for Quit) fol-
lowed by Y (for Yes) to acknowledge you want to quit the transfer
mode.

In the DOS 3.3 version, your work disk must be in the same drive
that the program was started in. If it is not in the same drive, the
transfer module will not be found and the program will attempt to
return to the terminal mode. If your work disk is not in the same
drive, the terminal program will not be found either and the pro-
gram will halt. An error message will prompt you to insert your
work disk in the drive and press any key to re-start the program.
After you return to the terminal mode with your work disk in the
proper disk drive, you can try to enter the transfer mode again
with the Y command.

If you will be using a protocol transfer, the format of the data
being sent or received must have 8 data bits. Set the proper data
word length and baud rate while you are in the terminal mode
before you enter the transfer mode.

If you are transferring to or from an unattended remote system, you
will have to issue the proper commands to initiate the transmitting
and receiving at both ends. For example, if you are transmitting a
file to a remote system, you must issue the appropriate receive com-
mands to the remote system followed by the appropriate transmit
commands for your system.

If you are online with another individual user, he will enter the
commands for his system while you are only responsible for issuing
the commands for your system.

While you are in the transfer mode, you will not be able to send
characters from your keyboard. You can only transmit the con-
tents of one of your disk files or text from your buffer. Anything
received while you are in the transfer mode will not be displayed
unless you have initiated a non-protocol transmission. Therefore,
you should complete all commands (if online with an unattended
system) or message exchanges in the terminal mode before you enter
the transfer mode.

The contents of the capture buffer will remain unchanged when
you enter the transfer mode. However, the protocol file transfers
will use the buffer for block storage. If you send or receive a
disk file using the XMODEM or MMGR protocol, the buffer will
be cleared.

This paragraph applies if you have enabled the capture buffer and are in the transfer mode. If you transmit text from the capture buffer, the capture of received text into the buffer will be inhibited. This will prevent changes to your buffer if the receiving system is echoing your text back to you. If you transmit text from a disk file using the non-protocol method, any received echoed text will be captured. If you are transmitting a disk file with XON/XOFF pacing, received control-S and control-Q characters will not be captured. You cannot save the contents of the capture buffer to disk while you are transmitting a disk text file. If the buffer becomes full, a message will be displayed and the buffer will be turned off. The buffer will not be saved automatically to disk and you will not be prompted to save the contents to disk. You may save the buffer to disk after the disk transmission is completed.

Figure 9-1 shows a menu of commands in the transfer mode. You can display this menu in the transfer mode by entering a ? whenever the transfer command prompt is displayed.

The C, D, F, I, L, and R commands at the top of the transfer mode menu are the same as those used in the terminal mode and will not be described again. You can use the Q command to exit the transfer mode and return to the terminal mode. When you enter this command, you will be asked to acknowledge it. Answer Y (for Yes) to quit and exit to the terminal mode or answer N (for No) to remain in the transfer mode.

The T command lets you toggle the timeout value between NORMAL and NONE. For most protocol transfers, use the NORMAL timeout. If sparse random-access files are being transferred, the timeout may have to be inhibited so toggle the NONE option.

SEND TEXT FILES (NON-PROTOCOL MODE)

You can use the non-protocol mode to transmit text files from your capture buffer or from one of your disk files. This method does not use error detection or correction. It simply sends the contents of your buffer or disk file from the beginning to the end. If transmission noise corrupts some of the characters transmitted, they will appear as uncorrected errors at the receiving end.

FILE TRANSFER

C:Clear buffer   D:Disk functions
F:Full/half duplex   I:Insert auto LF
L:Look at status   Q:Quit
R:Restore buffer   T:Timeout

SEND TEXT FILES

N:Normal pace   V:Normal-Screen off
S:Slow pace   X:XON/XOFF pace
E:Wait for echo   P:Wait for prompt
Z:Pause after line

PROTOCOL SEND/RECEIVE FILES

1:Send MMGR file   2:Rcv MMGR file
3:Send XMODEM file   4:Rcv XMODEM file
5:Rcv XMODEM (mod)

Figure 9-1. Transfer Mode Menu

There are several different options available with non-protocol text transmissions. These options are listed in the transfer mode menu as N, V, S, X, E, P, and Z. These options will be described later. After you enter an option, you will have to specify whether to send text from your buffer or from a disk file. Enter B (for Buffer) or D (for Disk). If you enter D, you will have to enter the filename or pathname of the disk file you wish to send. If the file is not on the currently active disk drive or volume, you may enter a comma followed by D# and/or S# to specify another drive and/or slot.

If you are planning to send a disk text file, you may load the file from the disk into your buffer and send it from the buffer instead of transmitting it directly from the disk. This avoids online pauses while the disk reads the next sector or block and reduces the transmission time. You can load the file from the disk into your buffer without exiting the transfer mode.

When the text transmission is completed, a TRANSFER COMPLETE message will be displayed. If you want to terminate a transmission while it is in progress, try [ESC] or [CTRL] X.

You can use the I command to enable or disable the sending of a line feed character automatically after each transmitted CR character. If the receiving system requires line feeds, toggle the line feed on.

The following is a description of all of the options associated with non-protocol text transmission.

N:NORMAL PACE

The N option will provide file transmission without speed pacing or handshaking. The file characters will be sent as quickly as pos- (but not faster than the hardware baud rate).

If the receiving system is echoing your transmission back to you, it will be displayed on your video screen. If your video device cannot keep up with the baud rate in use, your sending rate will be reduced. For example, if your video device can only maintain

an effective display speed of 10000 baud and your communications hardware is set for 19200 baud, your actual sending rate will be held to less than 10000 baud.

V:NORMAL-SCREEN OFF

The V option is similar to the N option discussed above except your video screen will be disabled during the transmission. If the receiving system is echoing your transmission back to you, it will not be displayed on your screen. If your video display is limiting your transmission rate, you may use this option to transmit at the maximum rate (your hardware baud rate).

S:SLOW PACE

The S option transmits text at reduced speed. This accommodates other receiving systems which cannot handle transmissions at the actual hardware baud rate. Your sending rate can be controlled during transmission by depressing a number key from [1] (slow) to [9] (fast). The initial rate is set at a medium speed (equivalent to [5]).

X:XON/XOFF PACE

The X option provides text transmission with XON/XOFF handshaking. If the receiving system sends a control-S (XOFF), your system will stop sending until the receiving system sends a control-Q (XON). If the receiving system has XON/XOFF handshake capability, it can use this feature to control the pace of your transmissions.

E:WAIT FOR ECHO

You can use the E option with any receiving system which echoes your transmission back to you. If you select this transmitting option, your file will be sent one character at a time. After each character is sent, your system will wait for that character to be echoed back before the next character is sent. Although this does provide some form of error checking, it is not a reliable error detector because it allows (ignores) characters added by noise. It does not perform any error correction either. This method is used primarily to pace your transmission speed to the capabilities of

the receiving system.

P:WAIT FOR PROMPT

Some receiving systems will send a prompt character or string when they are ready to receive a new line of text from your system. The P option allows you to define a prompt string with a length of 1 to 16 characters. If you just enter [RETURN], the CR character will be used as the prompt character. All other control characters except escape, control-H or control-J may be used in the string. After each line in the text is transmitted, your system will wait for the prompt character or string from the other system before sending the next line of text.

If you are sending text through a communications system which delays the echoing of your text, be sure the prompt character or string does not appear in your transmitted text or it may initiate the sending of the next line when it is echoed.

You may wish to format your transmitted text to something less than the full screen width so your text will not be wrapped around when the prompt and echoed text are displayed on the same line. For example, if you have an 80-column screen and the prompt string is 4 characters long, you can format your text to less than 76 characters before sending it.

Z:PAUSE AFTER LINE

The Z option is another pacing control for use with slow receiving systems which cannot handle a continuous flow of text at the hardware baud rate. If you use the Z command, your system will pause after sending each line of text. The pause length can be controlled during transmission by depressing a number key from [1] (slow) to [9] (fast). The initial rate is set at a medium pause length (equivalent to [5]).

You may also use this method for manual line pacing. Set the pause length to the slowest ([1]). Press the space key whenever you want a line transmitted.

PROTOCOL SEND/RECEIVE FILES

Protocol file transfers will let you transfer disk files accurately
to or from another system with error detection and correction.
MODEM MGR supports two types of protocol file transfers.

MODEM MGR supports the popular XMODEM transfer protocol.
This protocol was developed by Ward Christensen and others and is
used in many communications software packages and remote systems
which provide download capability of public domain programs.
You can transfer files with most of these systems using XMODEM.

MODEM MGR also supports a special MMGR protocol which pro-
vides protocol transfers between MMGR users having the same
operating system (DOS 3.3 or ProDOS). The major differences
between this special protocol and the XMODEM protocol are sum-
marized below.

1) The XMODEM protocol uses 128 bytes per transmitted block,
 while the MMGR protocol uses 256 (DOS 3.3) or 512 (ProDOS) bytes
 per block.
2) The MMGR protocol uses CRC error checking, while this pro-
 gram's version of XMODEM uses a checksum.
3) The MMGR protocol can truncate DOS 3.3 files so assigned but
 unused sectors at the end of a file are not transmitted.
4) The MMGR protocol does not transmit unused blocks in random-
 access text files. This provides minimum transmission time and
 efficient disk storage.
5) The MMGR protocol automatically sets the proper DOS 3.3 or
 ProDOS file type at the receiving system, while XMODEM does not.
6) XMODEM blocks are numbered starting at block 1, while the
 MMGR blocks start at 0.
7) XMODEM blocks must be sent sequentially, while blocks can be
 sent in any order with MMGR.
8) XMODEM does not allow missing blocks, while MMGR allows
 purposely skipped blocks. (However, blocks missed by transmission
 errors are detected).
9) XMODEM can transfer files between different operating systems,
 while MMGR handles DOS 3.3 to DOS 3.3 or ProDOS to ProDOS
 only.

TRUNCATED FILES

Some disk files have more sectors or blocks assigned on the disk than necessary. This occurs sometimes when a long file on a disk is replaced with a shorter file having the same name. The same number of sectors or blocks assigned to the long file will be assigned to the shorter file even though some sectors or blocks at the end of the file will not contain any data associated with the new file.

If you transmit a DOS 3.3 file with the MMGR protocol, only those DOS 3.3 sectors which contain data associated with that file will be transmitted. Any remaining unused sectors will not be transferred. This reduces the transfer time and the disk space used by the received file. This is done automatically unless the file is a text file. If the DOS 3.3 text file is a sequential-access text file, you must identify it as such in order to obtain file truncation. If you identify it as a random-access text file, the file will not be truncated when it is transmitted.

Whenever you save your buffer to disk, it is saved as a sequential-access text file. Most DOS 3.3 word processor text files are also sequential text files.

If you specify a DOS 3.3 random-access text file as being sequential, some or all of the file might not be transferred. If you specify a DOS 3.3 sequential-access file as being random, it will be transferred ok (possibly with some extra sectors). If you are in doubt as to the type of DOS 3.3 text file, enter R (for Random), or enter [RETURN] to default to random-access.

MODEM MGR truncates all ProDOS sequential text files when they are written to disk from the capture buffer. It will be assumed that most other programs which write ProDOS sequential text files will also truncate them. Therefore, this program will transmit ProDOS files as is. If you wish to truncate a ProDOS text file, you can load it into the text buffer and write it back to disk under the same pathname.

1:SEND MMGR FILE

Enter the 1 command to send a file using the MMGR protocol. The
other system you are communicating with should be running the
MODEM MGR program with the same operating system. Since DOS
3.3 and ProDOS disk files have a different format, you cannot use
the MMGR protocol to transfer files between DOS 3.3 and ProDOS
operating systems. If you must transfer files between a DOS 3.3
user and a ProDOS user, try the XMODEM protocol instead.

When you enter the 1 command to send the file, the other user
should enter the 2 command to receive the file using the same pro-
tocol. After the command is entered, the filename or pathname will
be requested of both users. The file should be on the currently
logged drive or current prefix or you may enter a comma followed
by D# or S# after the filename to specify another drive or slot.

If the file exists, the file type will be displayed. If it is a DOS 3.3
text file, the program will ask you whether it is a random or se-
quential text file. If you don't know what type of text file it is,
just enter a [RETURN] or R (for Random). You will then see the
following message:

> ^X to cancel
> Waiting for NAK

Your system will now wait for a NAK character from the receiving
system to show it is ready to receive. However, before it sends a
NAK, the receiving system must know the file type of the file you
are going to transmit. The file type will be sent automatically from
your system to the receiving system. You may see a few periods
(dots) on your screen while this is being accomplished. After the
file type is received, the receiving system will send a NAK and the
file transfer will commence. If you do not receive a NAK within
80 seconds, the transfer will be cancelled.

If everything has proceeded correctly, you will then see the follow-
ing on your video screen and your disk drive will read data from
the file to be transmitted.

Received NAK

Sending
0000

The 0000 means block 0 will be transmitted next. If a DOS 3.3
random-access file is being transmitted, the first block may be
something else besides 0000. As additional blocks are sent, you
will see their block numbers displayed as hexadecimal numbers.
The first block must be transmitted within 20 seconds after
receipt of the initial NAK or the receiving system will time out
and quit. If you are sending a random-access file, the blocks
which do not contain data will not be sent. If you are sending
a sparse random-access file, there may be a long period of disk
activity before any blocks are sent at all.

As each block is successfully received, the receiving system will
send an ACK character to request the next block. (You will not
see the ACK displayed.) If an error occurs, the receiving system
will send a NAK character and the same block will be retrans-
mitted. When this occurs, you will see the same block number
repeated on your display. If neither an ACK nor a NAK are re-
ceived within 10 seconds, the same block will be re-transmitted.

After 16 DOS 3.3 or eight ProDOS blocks (4096 bytes) are success-
fully transmitted, your disk drive will read an additional 4096
bytes. There will be a pause when your system is doing a disk read
and when the receiving system is doing a disk save. If the re-
ceiving system is using MODEM MGR also, it will do a disk save
every 4096 bytes. Both operations will probably occur consecutively
(not simultaneously), so there may be a double pause after every
16 DOS 3.3 or 8 ProDOS blocks.

After the file is successfully transferred, a FILE TRANSMITTED
message will be displayed.

If the communications link is noisy, a block may be re-transmitted
several times before it is successfully received. If it takes more
than eight tries, the transfer will be automatically terminated. You
can also terminate the transfer by entering a control-X. You will
see an I CANCELLED message on the screen. If you see a HE

CANCELLED message, it means the transfer was cancelled by the other system.

You cannot send any of the MODEM MGR main execution programs. These programs have names starting with the letters MDM (if DOS 3.3) or MDP (if ProDOS).

2:RECEIVE MMGR FILE

Enter the 2 command to receive a file using the MMGR protocol. The other system you are communicating with should be running a MODEM MGR program under the same operating system as yours and the user there should enter the 1 command to send the file using the same protocol.

After you enter the 2 command, you must furnish a filename or pathname. The name does not have to be the same as the name used by the sender's system. The file will be saved on the currently logged drive or you may enter a comma followed by D# or S# after the filename or pathname to specify another drive or slot. If you enter a file name which already exists, you will be asked whether you want to delete the existing file or not. Answer Y (for Yes) to delete it or N (for No) to retain it. If you enter N, you will be asked again for a filename or pathname.

You must accomplish all of the above within 80 seconds after the sending system is ready or that system will time out and cancel the transfer. If this occurs, you may see a HE CANCELLED message.

If the sender has set his system accordingly, his system will send the file type to your system so the file can be saved automatically as the same type. You may see a few periods (dots) on your video screen while this is happening.

After the file type is received and displayed on your video screen, you will see the following message:

> ^X to cancel
> Sending NAK

Your system is now sending a NAK character to the sending system

to signal you are ready to receive. It may take more than one transmission of the NAK character before the sending system starts to send the file. When this begins, you will probably see the following on your video screen:

        Receiving
         0000

The 0000 means block 0 is being received. A DOS 3.3 random-access file may show a higher starting block number. As additional blocks are received, you will see their block numbers displayed in hexadecimal numbers. If your system does not receive the first block within 20 seconds after your first NAK was sent, your system will time out and cancel the transfer.

As each block is successfully received, your system will send an ACK character to request the next block. If a header or CRC error occurs, your system will send a NAK character and the same block will be retransmitted. When re-transmission occurs, you will see the same block number repeated on your display. If a block transmission is interrupted longer than one second, your system will send a NAK for re-transmission.

After 16 DOS 3.3 or eight ProDOS blocks are successfully transmitted, your disk drive will save the blocks. There will be a pause when your system is doing a disk save and when the sending system is doing a disk read.

After the file is successfully transferred, you will see a FILE RECEIVED message.

If the communications link is noisy, you may see some of the following error messages:

        MISSING BLOCK
        BAD HEADER
        BAD CHECKSUM

A missing block error occurs if one of the transmitted blocks was not received correctly, but the sender received an erroneous acknowledgment and has sent the next block. When this error is detected,

your receiving system will cancel the transfer operation.

If a bad header or checksum error occurs, the block associated with the error will be NAKed until it is successfully received within eight retries. If it takes more than 8 tries, the transfer will be automatically cancelled. You can also terminate the transfer by entering a control-X. You will see an I CANCELLED message on your screen. If you see a HE CANCELLED message, it means the transfer was cancelled by the other system.

3:SEND XMODEM FILE

Enter the 3 command to send a file using the XMODEM protocol. The other system you are communicating with should be running an XMODEM-compatible transfer program. If the receiving system is using MODEM MGR, the user there should enter command 4. If the receiving user is using a DOS 3.3 or ProDOS operating system, he should be told what type of file is being transferred so he can enter it when necessary.

After you enter the 3 command, the filename or pathname will be requested. The file should be on the currently logged drive or prefix or you may enter a comma followed by S# or D# after the name to specify another slot or drive. When the file is found, the file type will be displayed. You will then see the following message:

        ^X to cancel
        Waiting for NAK

Your system will wait up to 80 seconds for a NAK character from the receiving system to show it is ready to receive. If the NAK is not received within that time, your system will cancel the transfer. If the receiving system user has set his system properly, it will send a NAK and the file transfer will commence.

You will then see the following on your video screen and your disk drive will read data from the file being transmitted.

Received NAK

Sending
001

The 001 means the first block will be transmitted. As additional blocks are sent, you will see their block numbers (002, 003, etc.) displayed in hexadecimal numbers. Your first block must be transmitted within 20 seconds after the receiving system sends its NAK. As each block is successfully received, the receiving system will send an ACK character to request the next block. (The ACK will not appear on your display).

If a header or checksum error occurs, the receiving system will send a NAK character and your system will re-transmit the block which was not received correctly. When this occurs, you will see the same block number repeated on your display. After 32 blocks are successfully transmitted, your disk drive will read additional sectors. There will be a pause when your system is doing a disk read and when the receiving system is doing a disk save. If the receiving system is using MODEM MGR also, it will do a disk save every 32 blocks. Both operations will occur consecutively (not simultaneously), so there will be a double pause every 32 blocks.

After the file is successfully transferred, you will see a FILE TRANSMITTED message.

If the communications link is noisy, a block may be re-transmitted several times before it is successfully received. If it takes more than eight tries, the transfer will be automatically terminated. You can also terminate the transfer by entering a control-X. You will see an I CANCELLED message on the screen. If you see a HE CANCELLED message, it means the transfer was cancelled by the other system.

You cannot send a DOS 3.3 file which has a name starting with the letters MDM and you cannot send a ProDOS file which has a name starting with the letters MDP. These letters are used for the MODEM MGR programs.

4:RECEIVE XMODEM FILE

Enter the 4 command to receive a file using the XMODEM protocol.
The other system you are communicating with should be running an
XMODEM compatible program. If the other system is using MODEM
MGR, the user there should enter the 3 command to send the file
using the XMODEM protocol. After you enter the 4 command, you
must enter the filename or pathname for your file to be saved on
your disk. It does not have to be the same as the name used by the
sender. The file will be saved on the currently logged drive or cur-
rent prefix or you may enter a comma followed by S# or D# after
the name to specify another slot or drive.

You will then be asked to enter the filetype (XMODEM does not
support the automatic sending of file type). You may select Text
(TXT), Binary (BIN), or Applesoft (BAS). For DOS 3.3, you may
select Integer also. If you enter an existing filename or pathname,
you will be asked whether you want to delete the existing file or
not. Answer Y (for Yes) to delete it or N (for No) to retain it. If
you enter N, you will be asked again for the name and filetype.

You will then see the following message:

> ^X to cancel
> Sending NAK

Your system is now transmitting a NAK character to the sending
system to signal you are ready to receive. It may take more than
one transmission of the NAK character before the sending system
starts to send the file. When this begins, you will then see the
following on your video screen:

> Receiving
> 001

The 001 means the first block is being received. As additional
blocks are received, you will see their block numbers (002, 003,
etc.) displayed in hexadecimal numbers. As each block is success-
fully received, your system will send an ACK character to request
the next block. If an error occurs, your system will send a NAK

character and the same block will be retransmitted. When this occurs, you will see the same block number repeated on your video screen. After 32 blocks are successfully received, your system will save the 32 blocks to disk. There will be a pause when your system is doing a disk save and when the sending system is doing a disk read.

After the file is successfully transferred, you will see a FILE RECEIVED message.

If the communications link is noisy, you may see some of the following error messages:

> MISSING BLOCK
> BAD HEADER
> BAD CHECKSUM

A missing block error will occur if you did not correctly receive one of the transmitted blocks, but the sender received an erroneous acknowledgment and has sent the next block. When this error is detected, your receiving system will cancel the transfer operation. This type of error message also appears if there are excessive delays during the block transmission. (See the next section on a modified XMODEM file transfer).

If a bad header or checksum error occurs, your receiving system will send a negative acknowledge (NAK) signal and the same block will be re-transmitted until it is successfully received or the re-try count exceeds eight. If it takes more than eight tries, the transfer will be automatically terminated. You can also terminate the transfer by entering a control-X. You will see an I CANCELLED message on your screen. If you see a HE CANCELLED message, it means the transfer was cancelled by the other system.

5:RECEIVE XMODEM (MODIFIED)

For efficient error detection, MODEM MGR interprets any pause of over one second during a block transmission as an error. Once a block transmission starts, this program expects to receive a continuous flow of data to the end of the block. This does not cause any problems when you are using XMODEM with another computer over

direct telephone lines. However, many information systems are using
phone networks which do not deliver data in a continuous flow.
There are times when the network introduces long pauses in a trans-
mission. If you are using XMODEM, you may see excessive block
repeats or a termination of the transfer with a missing block error
message.

If you enter the 5 command, you can receive a file using a modified
XMODEM protocol. This modified method allows a delay of up to
approximately 16 seconds during a block reception. Multiple delays
are allowed as long as any one delay does not exceed 16 seconds.
Since the network characteristics vary as a function of the traffic
level, it is difficult to optimize the modification to fit all situations.
You may find conditions where a protocol transfer cannot be per-
formed. The longer allowable delays will also cause longer error
detection and recovery times so do not use this option unless it is
necessary. If you select the 5 command, the same description
given for the 4 command applies.

TEXT GARBAGE

Since the XMODEM protocol transfers disk files, it not only trans-
fers the desired text in a text file, but it also transfers the residual
bytes that fill the remainder of the disk sector or block at the end
of the file. Normally the operating system determines the end of
the text and ignores these trailing characters when a text disk file
is read. However, with XMODEM you can transfer a text file
from one type of operating system to another type of operating
system which uses a different method to determine the end of the
text. You may then see the undesired residual characters when the
text disk file is read at the destination system.

If the residual characters are a string of common end-of-file char-
acters like 00 or control-Z characters, they will either not appear on
the display at the destination system when the file is read or they
may appear as ^@ or ^Z characters. However, if you have written
text to an existing text file before sending it with XMODEM, the
residual characters may consist of old text which is similar to the
new text. When the destination system reads the transferred file,
the residual text will appear at the end of the desired text. It may

be difficult to determine where the desired text actually ends and some confusion may occur.

If you have received a text file with XMODEM from a DOS 3.3 system to your ProDOS system, use the editor to find the ^@ which marks the end of the text and delete all of the text following that character. If you have received a text file with XMODEM from a ProDOS system to your DOS 3.3 system, there is no problem as long as the ProDOS residual characters are all 00s.

XMODEM COMPATIBILITY

Although the XMODEM protocol has been documented, there are many systems and software packages which have modified versions of XMODEM which may not be compatible with this version (this can be considered another version, also). Some software versions have been designed for a maximum anticipated transfer rate of 1200 baud. At this slow baud rate these versions can write status messages on console screens during reception. However, with 19200 baud transfers, received characters will be missed while they are writing these messages. The MMGR version of XMODEM adds some delays to accommodate these versions.

Some XMODEM versions will wait only a few seconds for an ACK after sending a block. If your disk drives take a longer time to save the received blocks, the sending system will re-send the block while you are still doing a disk operation. Duplicate block repeats will be detected and ignored, but this will cause additional delays to get back in synchronization. If your receiving operation seems to falter after a disk save, the other system may need longer delays.

MASTER CONTROL

When transferring between two individual users, both the XMODEM and MMGR protocols rely on both the sending and receiving users to set the appropriate commands. Unless they are in the same room, it is difficult for one user to determine if the other user has entered the proper commands and is ready for the file transfer or is still trying to figure out which commands to enter. It may be simpler if one user enters the unattended mode (described in Chapter 10.

The other user can call the unattended system and perform all of
the commands to accomplish a XMODEM or MMGR protocol transfer.
The advantage of this is one person is in control of both systems
and can enter all of the commands for sending and receiving with-
out relying on the other user.

SPARSE RANDOM-ACCESS FILES

Random-access files do not always have data written in all of the
file records. If any one of the disk blocks in a file is composed
entirely of records which have never been written, that block does
not exist on the disk. Since an applications program has not writ-
ten data anywhere in the block, there is no reason to use up disk
space for it.

As an extreme example, suppose a ProDOS random-access file has a
record size of 256 bytes and the allowable record numbers range
from 0 to 65,535. If you have written data only to record 1 and
record 65,534, the blocks containing records 1 and 65,534 are saved
to disk, but the blocks containing records 2 through 65,533 have
never been saved to disk. Although the file size is over 16,776,704
bytes (over 16 Megabytes), there are only two disk blocks allocated
with data (plus an additional three index blocks for a total of five
disk blocks).

If you want to transfer this file, there is no point in wasting time
transferring the disk blocks with non-existent records 2 through
65,533. The only blocks which have to be transferred are the blocks
with records 1 and 65,534. If you transmitted all 65,536 existent
and non-existent records at 1200 baud, it would take more than 38
hours to transmit the file.

If you use the MMGR protocol to transfer this file, only the alloca-
ted blocks are transmitted. First, the block with record 1 is read by
the program. Since MMGR waits until 4096 bytes are read before
transmitting, the program will then look for the next block with a
record. It will take no more than 10 minutes for the operating sys-
tem to search through the 16 Megabyte file to determine that the
next (and last) block to send is the block with record 65,534.

After the transfer is completed, the number of blocks used on the receiving system disk will be the same as on the sending system (five blocks for this sparse example).

Since the receiving system will time out before the 10-minute period is up, you should use the T command to select the NONE timeout option when a sparse random-access file is being received. With no timeout, the receiving system will initially send NAK for several minutes until the sending system has found enough data to send.

OPEN FILES

Once you start to receive a file with a protocol transfer, do not remove or swap the destination disk until the transfer is finished. If the transfer is interrupted, wait until all operations appear to be completed and you can display the "Xfer command? -->" prompt before removing the disk. If a FILE OPEN error message is displayed or if you remove the destination disk during a protocol receive operation, delete the file from the disk as soon as you can.

C H A P T E R   1 0

U N A T T E N D E D   M O D E

The unattended mode will let you or your friends call and access
your system from a remote location. The remote user can leave a
message in the buffer or in a disk file or retrieve a message from
the buffer or disk. Disk files can be sent to or received from the
remote user's system using either the XMODEM protocol or the
MMGR protocol supported by this program. The remote user can
also change logged drives and look at the directory (catalog) of
your disks.

After you specify the welcome message and password, no further
action is required on your part. Your system will automatically
answer calls, send the welcome message, ask for and verify the
password, provide help menus, and hangup when the remote user
is finished.

To use the unattended mode, you must have a modem which can
answer the phone in the answer mode, detect the remote carrier,
and hangup either automatically or under the direction of this pro-
gram. The following modems are among those which have these
capabilities:

  1) Apple Modem 300 or 1200
  2) Hayes Smartmodem 300, 1200, or 2400
  3) "Smart" modems which are Hayes-compatible
  4) Hayes Micromodem II or IIe
  5) Novation Apple-CAT II
  6) Novation Smart-Cat
  7) Prometheus Promodem 1200 or 1200A
  8) Transend ModemCard
  9) US Robotics Courier 2400
 10) Zoom Modem][e
 11) Most auto modems
 12) Apple Personal Modem

There are dozens of modems in category 3) which are compatible
with the Hayes Smartmodem command set. All of the ones tested
with this program worked in the unattended mode. However, there

may be a few which are not exactly compatible and do not operate
reliably in this mode.

If you are using an external "non-smart" modem, you must enable
carrier control and interface the modem carrier-detect (DCD) signal
properly to your computer. This interface is described in Chapters
4 and 11. If you are using an internal plug-in modem or an external
"smart" modem, you may set carrier control to ON or OFF. If you
set carrier control ON, you must interface the external modem
carrier-detect signal to your computer.

The Novation Apple-CAT II will operate in the unattended mode
using any of the three drivers you may have installed for this
modem. Unattended operation with the Apple-CAT in the 202 half-
duplex mode will have some slightly different characteristics than
with the other modes; we will describe this later in this chapter.

The diagram shown below shows how you can enter or exit the
unattended mode.


```
   TERMINAL   ---U--->   UNATTENDED
      MODE    <---QY---      MODE
```


You can enter the unattended mode by using the U command in the
terminal command mode. The remainder of this paragraph applies
to the DOS 3.3 version only. In the DOS 3.3 version, the work disk
must be in the same drive that the program was started in. If it is
not in the same drive, the unattended program module will not be
found and the the program will attempt to return to the terminal
mode. If the work disk is not in the same drive, the terminal pro-
gram module will not be found either and the program will halt.
An error message will prompt you to insert the work disk in the
drive and press any key to re-start the program. After returning
to the terminal mode with the work disk in the proper disk drive,
you can try to enter the unattended mode again with the U com-
mand.

After a few seconds of disk activity, the program will ask you to
enter the welcome message. This is the "hello" message which your

system will send to the remote caller when your modem answers the phone. The welcome message must not exceed 64 characters and can not include control characters. You may use the backspace key to edit your entry. After entering the welcome message, enter [RETURN]. If you don't want to have a welcome message, just enter [RETURN] alone. If you want to quit the unattended mode, enter [ESC].

Here are five example welcome messages:

Welcome to the IMSAI users group.
Joe: Read the message in file "TO.JOE".
Frank: Leave your arrival time in the buffer.
Call 555-1212 for more info.
THIS IS A PRIVATE SYSTEM.

After you enter the welcome message, the program will ask you to enter the password. This is the password the remote caller must use to access your system. The password must be 16 characters or less. It may consist of upper-case letters, numbers, or punctuation symbols. You may use the backspace key to edit the password. After you have specified the password, enter [RETURN]. If you don't want password protection, just enter a [RETURN]. If you want to quit, enter [ESC].

After you enter the password, the modem will switch to the answer mode. This may take a few seconds. You will then see the following message:

Waiting for call 01

The 01 means your system is waiting for the first caller. This number will be incremented for subsequent calls. Your system is now ready for a call and there is nothing further for you to do. If you want to quit this unattended mode, enter [ESC]. A few seconds may elapse before you are asked to confirm this. Enter Y (for Yes) if you want to quit and return to the terminal mode. Enter N (for No) if you want to remain in the unattended mode.

If you want to change the welcome message or password, you must exit the unattended mode and enter it again. These two entries can

be entered only during initial execution of the unattended mode.

The unattended program will not switch baud rates automatically.
You must select the desired baud rate while you are in the terminal
mode before you enter the unattended mode. You must tell all
potential callers which baud rate your unattended system is set up
for. (Don't forget to tell them the password also).

REMOTE CALLER

The preceding discussion described what you have to do to set up
your system for unattended operation. The remainder of this
chapter will cover what you have to do if you are the remote user
calling the unattended system.

You do not have to use MODEM MGR or an Apple computer to call
the unattended system. You can use any software and any computer
as long as you are able to transmit a CR character and the escape
character.

Before calling the unattended system, be sure your baud rate
matches the baud rate of that system. The unattended system will
echo any characters you send and will send a LF after each CR
echoed. If you are using MODEM MGR, be sure your program is in
full duplex and your program is not sending LF characters after CR
characters. (Unless you are using the 202 mode, which we will dis-
cuss later). This is the same setup you would use to call an infor-
mation or bulletin board system. Use the F and I commands if nec-
essary to set this operating environment.

Call the unattended system in the originate mode. The unattended
system will answer the phone and enable its answer-mode carrier.
Your modem should respond with its originate carrier. Wait a few
seconds for both modems to go online, then send a CR by pressing
the [RETURN] key. If your remote system does not have a
[RETURN] key, try control-M. If the unattended system doesn't
send the welcome message, wait a second or two and try again. The
CR character must be sent before the unattended system will
respond.

When the unattended system receives your CR, it will send you the

welcome message (if there is one) and ask you for the password.

You must send the correct password. If you make a mistake in
entering the password before entering [RETURN], you may use the
backspace key and correct your entry. If you send the wrong pass-
word, the remote system will warn you and allow you to make two
more tries. If you do not send the correct password with the three
attempts, the unattended system will hang up.

After the password is successfully recognized by the unattended
system, it will send you the following prompt which indicates it
is awaiting your command:

      [Command?]-->

Note: Most of the command and status messages sent by the unat-
tended system will be enclosed in [ ] brackets. This will help you
to distinguish between the commands and status of your system and
the commands and status of the unattended system. Some unat-
tended system disk error messages will not be enclosed in [ ].

If you do not see the [Command?]--> prompt, you can set the unat-
tended system into the command mode by sending an escape char-
acter. If you are using MODEM MGR to access the unattended
MODEM MGR system, remember that you must type [ESC] twice to
send the escape character (unless you have redefined the terminal
command key). When you enter [ESC] the first time, you will see
your own Command? --> prompt. After you enter [ESC] the second
time, the escape character will be sent and the unattended system
should reply with the [Command?]--> prompt. If you lose track of
the unattended system status, just keep entering [ESC] until you
see the bracketed [Command?]--> prompt from the unattended sys-
tem. If you have changed your terminal command key to some other
key, just type [ESC] once to send the escape character to the unat-
tended system.

If you send the ? character as a command to the unattended system,
it will send the menu shown in Figure 10-1. These are the com-
mands the unattended system will respond to. These commands are
similar to the commands used in the terminal and transfer modes,
and will be briefly described.

REMOTE COMMANDS

B:Buffer ON/OFF   C:Clear buffer
R:Restore buffer   V:View buffer
L:Look at status   H:Hangup
D:Disk functions   X:XON/XOFF
1:Rcv MMGR file   2:Snd MMGR file
2:Rcv XMODEM file 4:Snd XMODEM file

Figure 10-1. Unattended System Menu

[DISK COMMANDS]   [DISK COMMANDS]

Drive=1   Prefix=/MMGR/

C:Catalog   C:Catalog
R:Read file   R:Read file
W:Write file   W:Write file
D:Drive   P:Prefix
                         D:Drive

Figure 10-2a   Figure 10-2b

If you send a character to the unattended system which is not one of these commands, the unattended system will exit the command mode and enter the terminal mode. If you send an escape character to the unattended system while it is in the terminal mode, it will switch to the command mode. This is similar to the type of operation used in the normal (attended) terminal mode.

B:BUFFER ON/OFF

The B command will toggle the capture buffer of the unattended system on or off. When the buffer is on, any text you send to the unattended system will be captured in its buffer. You can send text from your keyboard or you can send text from one of your disk files using any one of the non-protocol methods in your transfer mode.

If your disk file is sent with a non-protocol transfer and it has an escape character in it, it will switch the unattended system into the command mode. The character in your file following the escape character will be considered a command by the unattended system and some undesired response may take place.

If your disk file has some unusual characters like the escape character in it, use a protocol transfer to send it to the unattended system. Protocol transfers with the unattended system will be covered later.

Since any user can clear the buffer of the unattended system, you should save anything of significance you have sent to the unattended system to its disk.

If the buffer is off, received text will not be captured in the buffer of the unattended system.

C:CLEAR BUFFER

The C command will clear the buffer of the unattended system. If you wish to restore the buffer, see the restore command.

The buffer will also be cleared if you send files to or receive files from the unattended system using a protocol transfer.

R:RESTORE BUFFER

If you have cleared the buffer of the unattended system and want
to restore it again, enter the R command immediately to restore it.

V:VIEW BUFFER

The V command will let the unattended system transmit the contents
of its buffer to you. You can halt and restart the transmission by
sending the space character and you can cancel the buffer transmis-
sion by sending a CR (except in the 202 mode).

L:LOOK AT STATUS

When the L command is sent to the unattended system, it will send
you a summary of its status. The following is a typical summary
of the status of the unattended system:

        [BUFFER ON]
        [XON/XOFF ENABLED]
        [0/34047]
        [LAST DISK ERROR: NONE]

Note the status sent by the unattended system will be enclosed in [ ]
brackets.

The first status line shows whether the buffer is on or off. The
second status line shows whether XON/XOFF is enabled or disabled.
The third status line shows the number of bytes captured in the
buffer and the space left in the buffer. The fourth status line
shows the last disk error during protocol transfers.

If a disk error occurs at the unattended system when protocol
transfers are being performed, the remote system will not display
the received error message because it is looking for a handshake
character instead. A disk error will also force a termination of
the transfer so the remote system disk file may be busy closing
the disk file when the disk error message is transmitted.

Therefore, disk error messages during protocol transfers are saved

for display on the last status line. If a protocol transfer has been cancelled by the unattended system, use the L command to check if a disk error occurred. After you have requested the status of the unattended system by using the L command, the last disk error status will be reset to NONE.

H:HANGUP

The H command will force the unattended system to hangup. You should always execute this command when your session with the unattended system is completed to provide a positive disconnect at the unattended system.

D:DISK FUNCTIONS

The D command will let you execute remote control of some disk operations at the unattended system. When you enter this command, the unattended system will send a [Disk command?]--> prompt. If you enter a ?, you will see either the DOS 3.3 or ProDOS remote disk functions menu in Figure 10-2a or 10-2b.

The Drive= or Prefix= shows which drive or prefix is currently active at the unattended system. The D command can be used to change the logged drive. In addition, the ProDOS version allows the P command to change the active prefix. The menu shows the disk commands you can use. These commands are similar to the disk functions described in chapter 6, with the following differences:

1) You cannot erase a disk file directly. However, you can effectively erase an unlocked disk file by over-writing it with another file having the same name.

2) You can read or write text files only. Use the protocol transfer to send or receive other types of files.

3) With DOS 3.3, you cannot specify another disk slot. With ProDOS, you can specify a prefix on another slot.

X:XON/XOFF

The X command will enable or disable the XON/XOFF handshake

at the unattended system. When XON/XOFF is enabled, the unat-
tended system will transmit a control-S when its input buffer is
nearly full. If the remote system uses XON/XOFF hand-shaking,
it should stop transmitting. When the input buffer level becomes
empty, the unattended system will transmit a control-Q, and the
remote system can resume sending again.

When XON/XOFF is disabled, the unattended system will not trans-
mit any handshaking signal.

If the remote system also responds to control-S and control-Q as
handshake signals, then XON/XOFF should normally be enabled
at both the remote and unattended systems.

1:RECEIVE MMGR FILE

The 1 command lets the unattended system receive one of your disk
files using the MMGR protocol file transfer. The unattended sys-
tem will ask you to furnish the filename or pathname under which
that system will save the transferred file. The file will be saved on
the currently logged disk at the unattended system or you can append
a comma followed by D# after the filename to specify another
drive number #.

If a file with the same name exists on the drive at the unattended
system, that system will send you an error message. With protocol
transfer to an unattended system, you cannot send a file with a
name which currently exists on the same drive of that system.
After you have specified a suitable name, you will receive a ready-
to-receive message. You must then switch to your transfer mode.
Do this by entering [ESC] to get into your terminal command mode
(Command? --> displayed) and Y to enter your transfer mode).

When you are in your transfer mode, enter the same 1 command.
For your remote system in the transfer mode, this is the command
to send an MMGR file. Note the same command number (in this
case command 1) is used for both the unattended system command
and your transfer command. This makes it easier to insure you
have picked the correct complementary commands ('receive' at the
unattended system and 'send' at your remote system).

After you specify the name of the file to send, the transfer will proceed in the manner described in Chapter 9. Refer to that chapter for details. When the transfer is completed, quit the transfer mode. When you are back in your terminal mode, you will still be on-line with the unattended system.

2:SEND MMGR FILE

The 2 command lets the unattended system send you one of its disk files using the MODEM MGR protocol file transfer. The unattended system will ask you to furnish the filename or pathname of the file to send. The file should be on the currently logged disk at the unattended system or you can append a comma followed by D# after the filename to specify another drive number #.

If the file exists at the unattended system and it is not a DOS 3.3 text file, that system will send you a [Ready to send] message. You must then enter your transfer mode and prepare to receive the file. If it is a DOS 3.3 text file, the unattended system will ask you whether it is a sequential or random text file. See the discussion in chapter 9 regarding the differences in transferring DOS 3.3 sequential and random text files. If the file does not exist, you will receive a [FILE NOT FOUND] message and will be asked for the name again.

When you are in your transfer mode, enter the same 2 command. For your remote system in the transfer mode, this is the command to send a MMGR file. Note the same transfer command number (in this case command 2) is used for both the unattended system command and your remote command.

After you specify the filename or pathname to use for saving the file on your disk, the transfer will proceed in the manner described in Chapter 9. When the transfer is completed, quit the transfer mode and return to the terminal mode.

You cannot transmit any of the MODEM MGR main execution programs from the unattended system. These programs have names starting with the letters MDM (if DOS 3.3) or MDP (if ProDOS). If you attempt to have these files transmitted, the unattended system will hang up.

3:RECEIVE XMODEM FILE

This command is similar to the 1 command for receiving a MMGR
file. The major difference is the XMODEM protocol is used instead
of the MMGR protocol. You must also specify the type of file
under which the unattended system will save the received file. The
file types are either TXT, BIN, or BAS. The Integer file type is
allowed with DOS 3.3. When you enter your transfer mode to send
your file, use the same command number 3. Additional information
on XMODEM transfers is in chapter 9 and will not be repeated here.

4:SEND XMODEM FILE

This command is similar to the 2 command for sending a MMGR file.
The major difference is the XMODEM protocol is used instead of the
MMGR protocol. You must also specify the type of file under which
your system will save the file sent by the unattended system.

When you enter your transfer mode to receive your file, use the same
command number 4. Additional information on XMODEM transfers
is in chapter 9.

TIME-OUT

If you don't transmit anything to the unattended system for a long
period of time, the unattended system will send you a [BYE] mes-
sage and hang up. This is an automatic disconnect in case you have
become distracted by another more important activity. This also
provides an eventual hangup if you disconnect without issuing the
hangup command to the unattended system and that system does not
have carrier control enabled. To prevent time-out, you should occa-
sionally send a character or command to the unattended system to
show you are still there.

TERMINATION

When you are finished, the best way to terminate the session with
the unattended system is to execute the H command when that system
is awaiting a command from you. This will force the unattended
system to hang up and reset for the next caller. After the unattended

system acknowledges the hangup command, you can then hangup
your system.

If the unattended system is not using carrier control and you hang-
up your system without commanding the unattended system to hang-
up first, the unattended system will probably hang up also (if the
modem disconnects automatically), but the unattended system will
not reset until it times out. This will make it unavailable to any
other caller during the time-out period.

However, if the unattended system is using carrier control, it will
hangup and reset immediately even if you hangup first. It is a good
practice at the end of a session to issue the hangup command to the
unattended system even if it has carrier control.

MANUAL OVER-RIDE

The operator of the unattended system (SYSOP) can enter commands
and text from his keyboard and the system will respond as if they
were received from the remote caller. This "attended" operation can
be useful in providing assistance for a caller who is not familiar
with the system commands.

BUFFER OVERFLOW

Although a large input buffer (not the same as the capture buffer)
is used at the unattended system, buffer overflow can occur if you
are using a non-protocol transfer to send a long file from the
remote system at the effective baud rate continuously without
XON/XOFF handshaking.

The unattended system echoes incoming text and inserts a LF after
each CR received. Therefore, the unattended system is normally
sending more characters than it is receiving. If the incoming text
is at the maximum rate (the hardware baud rate), the unattended
system must send more characters, but is limited to the same baud
rate for sending. Therefore, it cannot echo the incoming text at the
maximum throughput rate forever. If the incoming text is non-
stop, eventually the unattended system buffer will overflow. Select-
ing a lower baud rate is not a solution because although the rate at
which characters are being received is reduced, the sending rate is

correspondingly reduced also.

This is not a problem with protocol transfers because the incoming characters are not echoed and there are pauses between blocks trans-mitted.

To avoid buffer overflow on long non-protocol transfers, use a slow-er sending pace or enable XON/XOFF at the remote and unattended systems.

SMARTMODEM ESCAPE CHARACTER

In the unattended mode, MODEM MGR changes the "smart" modem escape character sequence from +++ to ---. This reduces interaction when both the remote and unattended systems are using "smart" modems. Do not change the "smart" modem escape character sequence.

APPLE-CAT II 202 MODE

If you are using the Apple-CAT 202 baud half-duplex driver, you can also use the unattended mode. Anyone calling your system must be using the same driver. Most of the same features described earlier for the unattended system are available, including protocol file transfers. One exception is the caller cannot interrupt non-protocol transmission of a disk text file or a view operation.

Since this is a half-duplex system, the caller must wait until the unattended transmissions are completed before sending his com-mands. The carrier hang-on time is reduced significantly on most unattended system transmissions so a slight delay is all that is re-quired.

Before you call the unattended system, use the terminal F command to place your system in half-duplex and use the I command to insert a LF after every CR you send.

CHAPTER 11

CARRIER CONTROL

Most modems have an output control signal which goes "high" or "on" whenever a remote carrier is detected. This indicates a connection has been made with another system. This carrier-detect signal (DCD) can be used to control some of the functions of MODEM MGR. The advantages of carrier control are:

1) You will realize more readily when an unanticipated disconnect occurs.

2) With non-smart modems, this is the only way for this software to determine a connection has been made. The connect status is required to support some macro commands and the unattended mode with non-smart modems.

3) In the unattended mode, your system will reset for the next call immediately after a disconnect instead of relying on timeout.

4) If you are using a macro or performing a file-transfer operation, it will terminate immediately if a disconnect occurs instead of con-tinuing to the end of the operation.

5) If you are receiving files using a protocol transfer, the files will be closed immediately if carrier is lost. Otherwise they will be closed when you cancel the transfer or timeout occurs.

The disadvantages of carrier control are:

1) Some "smart" modem result codes and status messages may not be received and displayed when there is no carrier. These include DIALING, NO DIALTONE, RING, BUSY, NO ANSWER, NO CARRIER, CONNECT and other messages.

2) If the carrier-detect signal is not properly connected to your computer, your system may fail to operate. The proper connection is already accomplished if you have an internal plug-in modem, but

you will have some additional interfacing effort with an external modem.

The second disadvantage above is the reason we have promoted the initial operation of this program with carrier control disabled. After you become familiar with this program you may wish to try it with carrier control enabled to see if you prefer this mode of operation.

If all you want is attended communications, you can get by with carrier control disabled. If you have a good feel for what your hardware is doing, and have a method of monitoring your modem status, you don't need the extra benefits of carrier control.

If you are aware of the advantages (and disadvantages) of carrier control and are reasonably sure you can interface your hardware correctly, then proceed with the remainder of this chapter.

In order to utilize carrier control, you must do three things:

1) You must set carrier control ON (enabled). This is one of the defaults you can set when you use the INSTALL program.

2) If you have an external modem, you must wire the carrier-detect signal (DCD) from your modem to your computer so MODEM MGR can determine the carrier status.

3) On some modems, you must set a carrier detect switch to enable carrier status output.

ENABLING CARRIER CONTROL

You can set carrier control ON (enabled) by executing the INSTALL program. When prompted by the program, insert your work disk to use your currently installed drivers. Insert the install disk when prompted and select option 7 to customize the default settings. When the default settings menu appears, select 12 to toggle carrier control from OFF to ON. Finally, insert the work disk and save the newly installed program.

Whenever carrier control is set ON, the status command (L) in the

terminal command mode will display CARRIER ON or CARRIER OFF as the last status message. If carrier control is disabled, there will be no carrier status shown. This is one way you can determine if carrier control has been enabled.

INTERNAL MODEM CARRIER CONTROL INTERFACING

Carrier control interfacing is easily implemented if you have an internal plug-in modem. Carrier-detect control interfacing is automatically accomplished when the card is plugged into your computer. On the Prometheus ProModem 1200A internal modem, you must also set configuration switch 3 to OFF to enable the normal carrier detect signal.

EXTERNAL MODEM CARRIER CONTROL INTERFACING

If you have an external modem, you will have to connect the carrier-detect signal from the modem to the appropriate input on your computer or serial interface card. In some cases, this is accomplished simply when you connect your cable between the modem and the card. In other cases, you will have to add or modify wires in your interface cable.

Most serial cards have several input control lines. These include a receiver control input and a transmitter control input. A communications program can use any of these control inputs for carrier control. MODEM MGR uses the receiver control input for carrier control. The reasons for this choice are:

1) Some serial cards have only one control input--the receiver control input.

2) If you are using a "smart modem", you should be able to transmit commands to the modem even when no carrier is present. Therefore, the transmitter control input must always be "high".

On most external modems, the carrier-detect signal is on pin 8 of the modem DB-25 connector. However, the receiver control input is not always on pin 8 of the connector at the serial card. Some common serial cards are listed at the end of this chapter in Table 11-1 along with the proper pin to connect the modem carrier-detect

signal to. On some cards you must also set a switch or jumper to
enable the input. This is noted where applicable in Table 11-1.

In many cases, you cannot use a "standard" interconnecting cable
with straight through pin-to-pin wiring to connect the carrier
control signal. For example, if you want to use carrier control
with the PSIO card, Table 11-1 shows you must wire pin 8 of the
modem to pin 5 of the PSIO cable connector. You must also install
card jumper J2 between the center pin and the right-most pin.

In Table 11-1, note the Apple //c and the Alphabits card have a
five-pin round DIN connector instead of a DB-25 connector. The
numbering convention used for the DIN connector corresponds to
Apple's convention. Note also the Apple Communications card does
not support carrier control.

If your serial card is not listed in Table 11-1, contact the card
manufacturer to determine which pin is used for receiver control
or inspect the schematic diagram (if there is one) in the card in-
struction manual. Find the ACIA chip on the schematic (usually
a 6551 or 6850) and trace the DCD signal on the chip through the
various circuit stages to the connector pin. Sometimes this pin is
on the card connector and not the cable DB-25 connector so you
will have to trace the signal path through the cable.

The Apple Modems 300 and 1200 do not use DB-25 connectors. The
carrier detect signal on these modems is on pin 7 of the nine-pin
DB-9 modem connector. If you are using the interface cable (Apple
Part No. 590-0121) from the //e modem accessory kit, this signal
will appear on pin 5 and pin 8 of the DB-25 connector on that cable.
If you are using the interface cable (Apple Part No. 590-0192) from
the //c modem accessory kit, the carrier detect signal is not cabled to
the five-pin DIN connector. The modem DSR signal (which is
always high) is cabled to the DIN connector so the carrier status will
always be on. Therefore, you cannot use carrier control with this
cable unless you modify the cable or use an adapter cable between
the modem and the cable.

To achieve carrier control with this cable, an adapter cable with
a male DB-9 connector on one end and a female DB-9 connector on
the other end should be wired as follows:

DB-9 male	DB-9 female	Function
3	3	Signal ground
5	5	Data from modem to //c
6	6	DTR modem input
7	2	DCD carrier detect
8	8	Chassis ground
9	9	Data from //c to modem

Note five wires are wired between the same pin numbers, but one wire (the carrier detect signal) is not.

MODEM DCD ENABLE

If you are using an external modem, you will probably have to enable the carrier-detect signal output on the modem. Most modems have a switch which will either set this DCD signal permanently high or allow it to follow the carrier status. In Chapter 3, you were directed to set this switch to output a continuous high signal. To use carrier control, change the setting of this switch so the carrier-detect signal will provide the proper carrier status. Some "smart" modems do not have this switch so the carrier-detect signal always follows the carrier status.

If you have a Hayes Smartmodem 2400, the modem DCD function will be set automatically by this program depending on whether you have carrier control enabled or disabled. Always power the Smartmodem 2400 on before starting the program.

REMOVING CARRIER CONTROL

If you have interfaced your system so it will respond to carrier control and you wish to remove carrier control, set the modem switch so the carrier-detect signal is high all the time and run the INSTALL program to set carrier control OFF (disabled).

TABLE 11-1. Serial Card Carrier Control Input

Apple Communications - none
Apple Super Serial (Switch SW1-7 ON) - pin 8
Apple //c - pin 5 *
Apricorn Serial - pin 6
Apricorn Super Serial Imager - pin 8
AST Multi I/O - pin 6
CCS 7710 - pin 20
CCS 7711 - pin 6 or 8 (DTR jumper ON)
Mountain CPS - pin 8
Pract. Periph. Seriall (HHS jumper on 5) pin 8
Prometheus Versacard - pin 6
Quadram Multicore - pin 6
Street Alphabits - pin 5 *
Transend AIO - pin 8
Transend ASIO - pin 8
Videx PSIO - pin 5 (Set J2 to right-most pin)

* Five-pin round DIN connector

C H A P T E R   1 2

P R I N T I N G

Although you don't need a printer to utilize most of the features
of MODEM MGR, a printer can be useful for printing out text re-
ceived while online, text from the capture buffer, or text from a
disk file. To obtain printer support, you must specify your printer
interface card when you execute the INSTALL program. You must
also connect and configure the printer for your system.

It is your responsibility to have your printer interfaced with your
system. If your printer and interface are not installed properly,
this software will not provide printer support.

Printing can be toggled ON or OFF if you use the P command in
the terminal command mode. We will also present other methods
of controlling the printing in this chapter.

PARALLEL PRINTER INTERFACING

MODEM MGR supports most parallel printer cards and printers
which use the standard Centronics-type parallel interface. Typi-
cally the printer requires a negative strobe from the printer card
and issues a negative acknowledge signal back to the card. In
most cases all you have to do is connect a suitable cable between
the printer card and the printer.

Some parallel printers use a positive strobe and/or acknowledge sig-
nal. If your printer or printer card has switches or jumpers which
allow you to select the polarity of the strobe and acknowledge sig-
nals, then you can set the switches to achieve a compatible combi-
nation.

Some parallel printer cards do not have switches or jumpers to alter
the signal polarities. In this case, the card characteristics must con-
form to the printer requirements.

A few parallel printer cards provide software control of the polar-
ity of the handshake signals. Software patches to alter the strobe

or acknowledge signal polarities are available for the following cards:

Interactive Structures PKASO/U card
Quadram Multicore card
SSM AIO card

If you have a parallel printer, skip the following sections on serial printers.

SERIAL PRINTER INTERFACING

Serial printer cards can be classified into types (Type 2651, 6551, 6850, 8251, etc). Refer to the serial card descriptions in Chapter 4 to determine the type of serial printer card you have. The card type for a serial card used as a printer card is the same as when it is used as a communications card.

In some cases, you can accomplish serial printer interfacing simply by plugging in the connecting cable. However, there are cases when printer interfacing cannot be achieved even with several hours of effort by an "expert" with hands-on access to your equipment and all instruction manuals.

The major serial printer interface problems involve the handshake connections between the printer and the serial card. It is beyond the scope of this manual to provide step-by-step instructions on interfacing a serial printer. We assume you have already installed your printer and it is functioning correctly.

You must provide some information to MODEM MGR so it can support the serial printer interface you have implemented. Do this by executing the INSTALL program and entering parameters corresponding to your serial printer configuration.

SERIAL PRINTER DATA LINES

Most serial cards will support printers as well as modems. Some serial cards have a separate cable connector for the printer function or a jumper block which configures the cable connector for printer operation. This provides the correct connections for the data signals and (sometimes) the handshake signals.

Some serial cards do not have built-in adaptability. These cards have the data output permanently assigned to pin 2 of the DB-25 connector. Although this is fine for modems, it is incorrect for most printers. Pin 2 on this type of serial card must must be wired to the pin 3 on the printer. The following serial or multi-function cards must have this wiring reversal performed to interface with most serial printers:

Apple Communications Card
Mountain CPS Multifunction Card
Prometheus Versacard
Quadram Multicore Card
Transend AIO Card

In addition, if you are using printer XON/XOFF handshaking, you must connect the data input on the card to the printer data output.

SERIAL PRINTER BUFFER

Most printers have a buffer which allows the printer to accept text from the computer at a faster flow rate than the printing speed. Buffers have a finite size limit so the flow of text must be controlled to avoid buffer overflow and loss of text. The printer controls the flow of text from the computer into the buffer by sending handshake signals to the computer.

You can prevent buffer overflow by selecting a low baud rate for the printer serial interface and not using any handshake. For example, if your printer can print 100 characters per second, a printer serial baud rate of 300 baud (approximately 30 characters per second) will not cause buffer overflow. Although this avoids your having to set up handshaking, this method results in less than optimum printing speed.

If your printer prints a long document for a few paragraphs and then halts, or skips a block of text, you probably have a printer handshake problem. You should determine which handshake method is best for your system and implement that method. This involves configuring your printer and printer card and installing the proper cabling between the card and your printer. Most printer card manu-

facturers can tell you the best way to interface their card to a particular printer.

After you have set up the proper handshaking for your printer, you can install the proper parameters into this program to support the handshake method you have implemented. MODEM MGR supports either hardware handshaking or software XON/XOFF handshaking.

SERIAL PRINTER HARDWARE HANDSHAKING

For hardware handshaking, you must connect the "busy" line from your serial printer to the appropriate input on your serial printer card. Unfortunately, this "busy" line is never assigned to the same pin number on all serial printers. Your printer manual will usually provide the handshake pin number. It is assumed you have connected this line to the appropriate pin on the DB-25 connector at your serial interface card and know which pin number it is.

The handshake pins of several serial printer cards are in Table 12-1 at the end of this chapter. A handshake mask ($nn) used by this program is listed with each signal pin. After you have determined which pin you are currently using for hardware handshaking with your serial card, refer to the list in Table 12-1 to find the proper handshake mask (the hexadecimal number following the $). You will have to execute the INSTALL program and specify this handshake mask. Those interfaces shown with a * do not require a handshake mask because a default value is supplied by MODEM MGR. In some cases a switch or jumper on the card must also be set.

For example, if you are using a Serial1 card with pin 4 for handshaking, Table 12-1 specifies a handshake mask of $30 for the INSTALL program. You should also verify the HHS jumper on the Serial1 card is on position 1.

The handshake mask is always initialized when a new printer driver is installed so set this value after you load the driver.

A few more parameters must be installed if you are using hardware handshaking. You must set the value for printer XOFF to $00. This disables XON/XOFF handshaking and enables hardware handshaking. Finally, read the section on serial printer initialization in

this chapter and install the printer baud rate and data character-
istics.

SERIAL PRINTER XON/XOFF HANDSHAKING

If your printer is set up for software XON/XOFF handshaking, you
must set the characters used for printer XON and XOFF into this
program. This is performed by executing the INSTALL program
and specifying the hexadecimal values for printer XON and XOFF.
For example, if you are using $11 (sometimes referred to as DC1)
for XON and $13 (sometimes referred to as DC3) for XOFF, you
must enter 11 and 13 as the default settings in the INSTALL pro-
gram. If you are using hardware handshaking, be sure to set the
printer XOFF to 00.

If you are using software XON/XOFF printer handshaking, the
control inputs on the printer serial card must be held "high". The
DB-25 connector pins which must be held "high" are listed in Table
12-2 at the end of this chapter for some printer serial cards. If the
pin has an internal pull-up circuit, it is shown as (pu) and this pin
can be left disconnected. In some cases switches or jumpers are
used to set the control inputs high.

There are probably some pins which must be held "high" on the
printer end of the cable. Refer to the printer manual to determine
which ones must be kept "high".

SERIAL PRINTER INITIALIZATION

Some serial cards will let you set the default baud rate and data
parameters by providing dip switches, jumpers, or programmable
non-volatile RAM on the card. Some of these cards are listed in
Table 12-3. After you have set the desired parameters, the card
will retain and use these parameters for initialization. Whenever
you power your computer on and enable the print function,
MODEM MGR will read the default baud rate and data parameter
settings and set the operating parameters accordingly. You may
override the switch or jumper settings by specifying a non-zero
value for the printer command byte in the INSTALL program. The
printer command and control bytes will then be used for initializa-
tion.

On those cards without the capability to define default settings,
MODEM MGR will set the parameters based on hexadecimal values
you enter specifically for this program. You can enter these values
by executing the INSTALL program and specifying the parameters
in the form of printer command and control bytes. If you specify
$00 for the printer command byte, the program will default to 9600
baud, 8 data bits, 2 stop bits, no parity for Type 2652, 6551, and
8251 cards, and 8 data bits, 2 stop bits, no parity at the baud rate
selected by the card switch for Type 6850 cards.

Some typical parameters and the corresponding bytes are listed
below.

TYPE 2651 SERIAL PRINTER CARDS

	Printer Command byte	Printer Control byte
9600 baud, 8+2+none	$CE	$3E
9600 baud, 8+1+none	$4E	$3E
9600 baud, 8+1+odd	$5E	$3E
9600 baud, 8+1+even	$7E	$3E
1200 baud, 8+2+none	$CE	$37
1200 baud, 8+1+none	$4E	$37
1200 baud, 8+1+odd	$5E	$37
1200 baud, 8+1+even	$7E	$37

TYPE 6551 SERIAL PRINTER CARDS

	Printer Command byte	Printer Control byte
9600 baud, 8+2+none	$0B	$9E
9600 baud, 8+1+none	$0B	$1E
9600 baud, 8+1+odd	$2B	$9E
9600 baud, 8+1+even	$6B	$9E
1200 baud, 8+2+none	$0B	$98
1200 baud, 8+1+none	$0B	$18
1200 baud, 8+1+odd	$2B	$98
1200 baud, 8+1+even	$6B	$98

TYPE 6850 SERIAL PRINTER CARDS
(Baud rate set by switch)

	Printer command byte
8+2+none	$11
8+1+none	$15
8+1+odd	$1D
8+1+even	$19

TYPE 8251 SERIAL PRINTER CARDS
(Quadram Multicore)

	Printer Command byte	Printer Control byte (Baud Rate)
8+2+none	$CE	$00= 150, $01= 300,
8+1+none	$4E	$02= 600, $03=1200,
8+1+odd	$5E	$04=2400, $05=4800,
8+1+even	$7E	$06=9600

The printer command and control bytes are initialized to 00 when a new printer driver is installed so set their values after you select a printer driver.

You do not have to specify a printer control byte for Type 6850 serial printer cards. If you have a Type 2651 printer card, use the 2651 mode register 1 byte as the printer command byte and use the mode register 2 byte as the printer control byte in the INSTALL program.

For example, if your are using an Apple Super Serial card (a Type 6551 serial card) and a printer set up for 1200 baud, 8 data bits, 2 stop bits, and no parity, install $0B as the printer command byte and $98 as the printer control byte.

ADDITIONAL PRINTING PARAMETERS

There are several additional printing parameters and defaults which

you may set with the INSTALL program. To install these param-
eters, execute the INSTALL program and select option 7 on the
main installation menu to set the defaults. A description of these
additional printer defaults is provided below.

PRINTER ON/OFF

If you select this default, it will set the initial printing state to ON
or OFF when MODEM MGR is first started. Normally you want this
to be OFF so the printer will remain off-line until you have some-
thing to print.

SEND PRINTER LF

Some printer/printer card combinations require a line feed be sent
to the printer by the program after each CR is sent. If this is true
for your system, set this default to ON or you will have continuous
over-printing on one line. If you are printing double-spaced lines,
set this default to OFF.

SET PRINTER BIT 7

Some printer/printer card combinations require bit 7 be set. If this
is true for your system, set this default to ON. If your printer prints
graphics characters instead of text characters, toggle this default.

PRINTER NULLS

If your printer requires nulls to mark time while the printer mecha-
nism executes a CR or LF or form feed, you can specify the num-
ber of nulls here. The number of nulls can be specified in the range
of $00 to $FF. If your printer does not require nulls, set this to $00.

PRINTER COLUMNS

You can specify the maximum number of columns printed. When
the number of characters on a line exceeds the specified column
width, the program will insert a CR (and LF if necessary) and the
remainder of the line will be printed on the next lower line. The
default is 80 columns ($50 hexadecimal). You may specify column
widths up to 255 columns ($FF hexadecimal).

PRINTER LINES

You can specify the maximum number of lines printed before the program sends a form feed character to direct the printer to move to the top of the next page. The default value is 60 lines ($3C hexadecimal). Normally there are 6 printed lines per inch. There are 66 lines on an 11" form, so the setting of 60 lines will provide three blank lines at the top and bottom of each page. This paging feature requires a printer which supports form feeds. To disable printer paging, set the printer form feed default to $00 (see printer form feed).

To use this paging feature, you should initialize the printer to the top of the page. Most printers have a switch which you can use to perform this initialization. Set the printer paper so the first line printed will be 1/2 inch (3 lines) below the top of the page. Toggle the printing ON (using the P command). This will reset the line counter used in this program. If the print function is already on, toggle it OFF and then ON again to insure the program line counter is reset. If the printer and program line counter are not both initialized, the page break will occur somewhere within the page instead of at the perforations between forms.

PRINTER FORM FEED

This defines the printer control character which directs the printer to move to the top of the next page. Usually this is $0C hexadecimal. If your printer does not support form feeds, set this to $00. Setting this to $00 will also disable the paging feature described above.

CONTROL-P PRINTER CONTROL

If you are printing while viewing the capture buffer or reading a disk file to the screen, you can also toggle the printer on or off by entering a [CTRL] P from the keyboard. This is useful if you want to print certain sections of the text. Use the number keys (if you are printing from the buffer) and/or space key to slow the text display or stop where you wish to start printing. Enter a [CTRL] P to start printing and another [CTRL] P to stop printing.

When you use [CTRL] P to start printing, it will not zero the line
counter used by this program. Therefore, if you are using the pag-
ing feature described earlier, the top-of-form condition must be ini-
tialized by using the terminal P command to toggle the printer on
when it is at the top of the first page before you use the control-P
commands.

IMBEDDED PRINT CONTROL CHARACTER

There is another way you can print selected portions of text in the
capture buffer or from a disk file. This is done by imbedding con-
trol characters directly into the text to control the printer.

First, you must select a control character to use. Suppose you have
selected a control-X (hexadecimal $18) as the imbedded print con-
trol character. Run the INSTALL program and set the value of 18
for the imbedded print control character.

Next, edit the text and set a control-X at the beginning of the text
to toggle the printer off (unless you wish to start printing at the
beginning). Insert an additional control-X at the beginning and end
of the block of text you want printed. You can repeat this for as
many separate blocks you wish to print.

As an example, look at the next paragraph. Suppose you want to
print out only the address. Edit the text to place three control-X
characters where shown. The first control-X will toggle the printer
off. This is necessary because the printer must be initially in the
on state and you want to turn it off at the beginning of the text.
The second control-X will toggle the printer on so it can print the
address. Finally, the last control-X will turn the printer off again.

^XFor sale: Teletype machine.
If interested, write to:
^XJohn Kleinschmidt
123 Main Street
Anaheim, CA 92806
^XThe minimum bid is 10 cents a pound.

To use the imbedded print control character, you must use the P com-
mand to toggle the printer on initially. If this is not done, nothing

will be printed out regardless of the placement of the imbedded
print control characters. To disable the imbedded print control
feature, toggle the printer off (with the P command), or remove all
imbedded printer control characters, or run the INSTALL program
and set the imbedded print control character to $FF.

Do not use a common control character for the imbedded print
control character. For example, control-G, control-H, control-I,
control-J, and control-M are often found in ordinary text. If
your printing stops and starts in unanticipated places, you may
have picked a control character which appears normally in the
text.

Table 12-1. Serial Printer Card Hardware Handshake

Apple Communications - (no hardware handshake)
Apple Super Serial - pin 4 or 5 (SW1-7 ON) - $30
Apple Super Serial - pin 19 (SW2-7 ON) - $30
Apple Super Serial - pin 20 - $50
Apple //c - pin 5 *
Apricorn Serial - pin 4 - $02
Apricorn Serial - pin 20 - $06
Apricorn Super Serial Imager - pin 4 - $10
Apricorn Super Serial Imager - pin 11 or 20 - $50
Apricorn Super Serial Imager - pin 9/10/13/14/15/16/17/18/
   19/21/23/24/25 (select) - $50
AST Multi I/O - pin 20 - $06
CCS 7710 - pin 4 - $02
CCS 7710 - pin 20 - $06
CCS 7711 - pin 4/9/11 (select) (RTS jumper ON) - $50
CCS 7711 - pin 20 (DTR jumper ON) - $30
Mountain CPS - pin 5 - $01
Mountain CPS - pin 6 - $81
Mountain CPS - pin 8 - $41
Orange Serial Grappler - pin 4 - $10
Orange Serial Grappler - pin 20 - $50
Pract. Periph. Serial1 - pin 4 (HHS-1) - $30
Pract. Periph. Serial1 - pin 5 (HHS-2) - $30
Pract. Periph. Serial1 - pin 11 (HHS-3) - $30
Pract. Periph. Serial1 - pin 19 (HHS-4) - $30
Pract. Periph. Serial1 - pin 20 (HHS-5) - $30
Prometheus Versacard - pin 5 - $02
Prometheus Versacard - pin 6 - $06
Quadram Multicore - pin 5 - $01
Quadram Multicore - pin 6 - $80
Street Alphabits - pin 5 *
Transend AIO - pin 5 - $02
Transend AIO - pin 8 - $06
Transend ASIO - pin 4 (E2,E3 jumpered) - $02
Transend ASIO - pin 20 (E1,E2 jumpered) - $02
Videx PSIO - pin 4 (J2 right-most) - $30
Videx PSIO - pin 20 - $50

* Five-pin round DIN connector

Table 12-2. Serial Printer Card XON/XOFF Handshake

Apple Super Serial - Set SW1-7 and SW2-7 OFF
Apple //c - pin 5 (pu) *
Apricorn Serial - pins 4 and 20
Apricorn Super Serial Imager - pin 4 (pu)
AST Multi I/O - pin 20 (pu)
CCS 7710 - pins 4 and 20
CCS 7711 - Set DTR and RTS jumpers to OFF
Mountain CPS - pins 5 and 8
Orange Serial Grappler - pins 4 and 20
Pract. Periph. Seriall - pin 20 (pu) (HHS on 5)
Prometheus Versacard - pins 5 (pu) and 6 (pu)
Quadram Multicore - pin 5 (pu)
Street Alphabits - pin 5 *
Transend AIO - pins 5 (pu) and 8 (pu)
Transend ASIO - Remove jumper at E2
Videx PSIO - Set jumper J2 on left-most side

NOTES:

(1) For XON/XOFF printer handshaking, the pin(s) listed above
must be held high. If the pin has a pull-up (pu), it may be discon-
nected instead of held high.

(2) The cards marked * have a five-pin round DIN connector.

Table 12-3. Serial Printer Card Initialization

Apple Super Serial - DIP switches
Apricorn Super Serial Imager - DIP switches
Pract. Periph. Seriall - DIP switches
Quadram Multicore - Non-volatile RAM (virtual slot 1, printer A)
Videx PSIO - Non-volatile RAM
Other cards - See notes below

NOTES:

(1) If you set the printer command byte to $00 with the INSTALL
program, the serial printer cards listed above will default to the
baud rate, number of data bits, number of stop bits, and parity set
by the DIP switches or non-volatile RAM.

(2) If you set the printer command byte to $00, all other cards with
baud rate switches or jumpers will have a default of 8 data bits, 2
stop bits, and no parity at the selected baud rate.

(3) If you set the printer command byte to $00, all other cards with-
out baud rate switches will have a default of 8 data bits, 2 stop bits,
and no parity at 9600 baud.

(4) If you set the printer command byte to a non-zero value, the
values used for the printer command byte and printer control byte
will establish the printer serial parameters.

C H A P T E R   1 3

T E R M I N A L   E M U L A T I O N

Large computer systems are often accessed by users through indi-
vidual terminals. This lets several users share the system. If you
want to use your computer to access the system, you would have to
emulate the characteristics of the particular terminal used.

This program will let your system emulate any one of several com-
mon intelligent terminals. With this emulation feature, you can use
your system as a directly-connected terminal or, with a modem, as
a remote terminal.

Most terminals produce special video functions when certain control
codes are sent from the host computer to the terminal. The computer
sends a control code or sequence of codes to the terminal when it
wants the terminal to execute a special video function. Some of the
special video functions include erasing portions of the screen, moving
the cursor to another screen location, or scrolling the display up or
down.

With suitable emulation, your system will generate video functions
which are identical to those generated by the terminal when the
same control codes are received. This allows your system to become
an equivalent replacement for the terminal.

Many terminals have special function keys which will send special
codes to the computer. Since the Apple keyboard does not have the
function keys, the terminal emulation will not be a complete emula-
tion. However, the programmable function keys supported by this
program can be used to provide emulation of up to nine function
keys. For most tasks, nine keys are adequate.

Terminal emulation requires the following steps:

1) The desired emulation file must be loaded.

2) Emulation must be enabled.

You can load the desired emulation file by using the [ESC] N com-
mand in the terminal mode. The program will ask you for the name
of the emulation file. All emulation files have the suffix ".EMU".
Enter the first part of the file name excluding the ".EMU" suffix.
All DOS 3.3 emulation files must be on the work disk.

If you always use the same emulation file, you can have that file
automatically loaded whenever you boot MODEM MGR by naming
the emulation file DEFAULT.EMU and placing the file on your
work disk.

You can enable or disable emulation by using the E command in
the terminal command mode. When you enable emulation, a xxxx
EMULATION message will be displayed, where xxxx refers to the
type of emulation. When you disable emulation, a NO EMULATION
message will be displayed. You can check the emulation status by
using the L command in the terminal command mode. The status
displayed will show whether emulation is ON (enabled) or OFF
(disabled).

This program provides emulation disk files for some popular termi-
nals. To use any one of the DOS 3.3 emulation files, you must move
the desired file to your work disk. There is also a program called
MAKE.EMULATION on the utility disk which will allow you to
generate your own emulation file or customize an existing file.

Terminals which use a single control character or a lead-in control
character followed by a displayable character can be emulated. The
only control sequence longer than two characters that can be emu-
lated is the GOTOXY sequence which commonly uses four charac-
ters. Terminals which make frequent use of sequences longer than
two characters (like ANSI X3.64 terminals) can not be emulated by
this program.

MAKING YOUR OWN EMULATION FILE

If this software package does not include an emulation file for the
terminal you wish to emulate, you can prepare your own emulation
file by using the MAKE.EMULATION program on the utility disk.
This program lets you match the control codes of the terminal with
the associated video functions on your system. You can also define

certain characteristics which are associated with the terminal.

You can execute the MAKE.EMULATION program with 40- or 80-
column video. Execute this program by entering RUN MAKE.EMU-
LATION. Be sure to use the utility disk with the same operating
system (DOS 3.3 or ProDOS) you are using. When you execute this
program, the menu shown in Figure 13-1 will be displayed. This
menu provides five commands which are described below. If you

       [ESC] to return to this menu

       1) Load Emulation File
       2) Control Character Functions
       3) Clear Functions
       4) Save Emulation File
       5) Quit

       Enter (1-5) -->

       Figure 13-1. Emulation Menu

wish to return at any time to this command menu, press the [ESC]
key.

LOAD EMULATION FILE

This command lets you load an existing emulation file. When you
execute this command, the program will ask you to insert the disk
with the emulation file and enter the filename or full pathname.
Do not enter the ".EMU" suffix which is part of all emulation file
names. This program will not accept commas in disk file names,
so you cannot use the D# and S# options. While the file is being
loaded, you will see a "Loading file" message and when the file is
loaded, you will see a "Press any key" message. When you depress
a key, this program will display the menu again.

CONTROL CHARACTER FUNCTIONS

This command lets you define the control codes and defaults for

the various video functions. There are three video function menus which can be toggled by pressing the [0] key followed by [RETURN]. The functions displayed in the three menus are listed below.

1) Clear screen:
2) Home:
3) Clear to end of screen:
4) Clear to end of line:
5) Cursor down:
6) Cursor up:
7) Cursor forward:
8) Cursor left:
9) Tab:
10) Reverse LF:
11) Send ID (Answerback):
12) Read screen:
13) Send cursor position:
14) Newline:
15) CR:
16) LF:
17) Roll enable:
18) Roll disable:
19) Hilight:
20) Lowlight:
21) Inverse:
22) Normal:
23) Bell:
24) GOTOXY:
25) GOTOXY offset:
26) GOTOXY order:
27) Lead-in char:
28) Tab spacing:
29) Vertical wrap:
30) Horizontal wrap:
31) Display wrap:
32) Scroll:
33) Emulation name:
34) Send cursor lead-in:
35) Send cursor offset:
36) Send cursor order:
37) ID (Answerback):

Although this is a long list, many of the functions are not used by
most terminals being emulated. To generate an emulation file for
a particular terminal, you must determine which control code the
terminal uses for a given video function. Assign that same control
code to the corresponding video function in your system. Repeat
this for all of the video functions supported by the terminal.

The instruction manual for the terminal usually lists the control
codes for all video functions. Some control codes consist of a single
control character, while other codes may require a sequence of
several characters. Often the sequence is preceded by a character
called the lead-in character.

To assign a control code to a video function in your system, toggle
between the three menus until the desired video function is shown.
Enter the associated menu number to select that function (followed
by [RETURN]) and enter the control code for that function (fol-
lowed by [RETURN]).

For example, let us define a lead-in character. Toggle through the
three menus until you see the menu which lists "27) Lead-in char:".
You may see a hexadecimal control code number already assigned to
this function. Enter 27 which is the menu number for this func-
tion followed by [RETURN]. You will see the current control code
value (if any) displayed again and the following prompt:

> Enter new value --> $

The "$" means the control code entered must be entered as a hexa-
decimal number. Suppose the terminal we want to emulate uses an
escape character (ascii $1B) as the lead-in character. Enter 1B (fol-
lowed by [RETURN]) to assign the new value. If you make a mis-
take while entering the value, use the backspace key and correct
the mistake before entering [RETURN]. Check the menu again and
verify the value $1B has been assigned as the lead-in character.

Let us now define a character to clear the screen. Toggle through
the three menus until you see the entry "1) Clear screen:". Suppose
we want to enter a control code value of $0C for this function.
Enter 1 followed by [RETURN] and enter 0C (or just C alone) fol-

lowed by [RETURN]. This will assign a $0C control code to the clear-screen function.

If a function requires a control sequence preceded by the lead-in character, enter an asterisk (*) first before the hexadecimal ascii number. The asterisk will represent the lead-in character.

For example, suppose we are trying to emulate a terminal which responds to the escape lead-in character followed by the letter v (ascii hexadecimal $76) to clear the screen. Remember we have already defined escape (ascii $1B) as the lead-in character. Enter 1 to define the clear-screen function and enter *76 as the control sequence. The screen prompt will automatically insert a "$" character after the "*" so the above entry will appear as *$76 on your video screen. If you make a mistake, use the backspace key and correct the mistake before entering [RETURN].

You may enter more than one control code or lead-in sequence for any video function. For example, the clear-screen video function can be assigned the value $0C as well as the lead-in sequence of escape followed by the letter v. This allows several control codes to generate the same video function. All of the control codes assigned to a given video function will appear on the menu.

However, you can use any particular control character only once for a video function. A given control code must generate one and only one video function. If you re-assign a specified control code for one video function to another video function, this program will automatically remove it from assignment to the previous video function.

For example, if you had assigned the control code $0C to the clear-screen function and you re-assign it to the home function, this program will remove it from the clear-screen function.

You can delete a control character by entering an X (followed by [RETURN]). The following prompt will be displayed:

        Enter hex value to delete --> $

Enter the hexadecimal ascii value of the control code to be deleted. Do not enter the menu number of the associated video function. If a lead-in sequence is being deleted, enter an asterisk (*) followed by the hexadecimal value of the following character.

For example, if the control code sequence of escape followed by the letter v is assigned to the clear-screen function (menu number 1), enter X to delete, and then enter *76. Do not enter 1, which is the menu number assigned to the clear-screen function, or you will delete the control code $01 (if it is assigned to a function).

CLEAR FUNCTIONS

This command will remove most of the control codes presently assigned to video functions. This command is usually used before creating a new emulation file to clear out most of the existing codes. The following common control code default assignments will remain as defaults:

Cursor Left	$08
LF	$0A
CR	$0D

The clear command will also establish the following default values for emulation:

Vertical wrap	OFF
Horizontal wrap	OFF
Display wrap	ON
Scroll	ON
Emulation name	"No"

When you execute this command, you will see a "Functions cleared" message and a "Press any key" message. Press any key to return to the main menu.

SAVE EMULATION FILE

This command lets you save the emulation file you have created or edited. When you execute this command, this program will ask you

to insert your work disk and enter the filename or full pathname.
A suffix of ".EMU" will automatically be appended to the file name
you specify. Do not enter the ".EMU" suffix. While the file is being
saved, this program will display a "Saving Emulation file" message.
After the file has been saved to disk, a "Press any key" message will
be displayed. Press any key to return to the main menu.

QUIT

This command will let you quit the MAKE.EMULATION program.
This program will prompt you to verify that you want to quit. Enter
Y (for Yes) if you want to quit and enter N (for No) if you don't
want to quit. If you are using ProDOS, you will be returned to
BASIC when you quit.

DESCRIPTION OF VIDEO FUNCTIONS

Each of the video functions which can be emulated by this program
are described below. Most terminals will have just a few of these
functions. Any unused functions can be made inoperative by remov-
ing any control codes associated with it. (Assigning the value $00
to a function will not make it inoperative.)

1) CLEAR SCREEN

This video function will clear (erase) the entire video screen and
place the cursor at the top left corner. In the split-screen mode, only
the upper screen will be cleared. If the clock display is enabled, the
time display will remain on the screen.

2) HOME

This function will place the cursor at the top left corner of the
screen (first column of first line).

3) CLEAR TO END OF SCREEN

This function will clear (erase) everything from the current cursor
location to the end of the screen. The cursor will remain in its cur-
rent position. In the split-screen mode, the bottom screen will not

be erased. If the clock display is enabled, the time display will remain on the screen.

4) CLEAR TO END OF LINE

This function will clear everything from the current cursor location to the end of the line. The cursor will remain in its current position.

5) CURSOR DOWN

This function will move the cursor down one line. The cursor will remain in the same column. If the cursor is on the bottom line and vertical wrap is off, the cursor will remain in the same position. If the cursor is on the bottom line and vertical wrap is on, the cursor will move to the same column of the top line.

Do not confuse this function with the line feed (LF) function which is slightly different. For most terminal emulations, the cursor down function is not used. Instead, the LF function is used by assigning it a value (usually $0A).

6) CURSOR UP

This function will move the cursor up one line. The cursor will remain in the same column. If the cursor is on the top line and vertical wrap is on, the cursor will move to the bottom line. If the cursor is on the top line and vertical wrap is off, the cursor will remain on the top line.

7) CURSOR FORWARD

This function will move the cursor one character position to the right. If the cursor is in the extreme right column and horizontal wrap is off, the cursor will remain where it is. If the cursor is in the extreme right column and horizontal wrap is on, a newline function (described in function 14) will occur.

8) CURSOR LEFT

This function will move the cursor one character position to the left.

If the cursor is in the extreme left column and horizontal wrap is off, the cursor will remain where it is. If the cursor is in the extreme left column and horizontal wrap is on, the cursor will move to the extreme right column of the next upper line. If the cursor is in the first column of the top line and horizontal wrap is on, the cursor will move to the last column of the bottom line.

9) TAB

This function will move the cursor to the next tab setting. If there are no further tab settings on the line, the cursor will move to the last column in the line. You can set the tab spacing by using function 28.

10) REVERSE LF

The reverse LF function will move the cursor up one line in the same column. This function is similar to the cursor-up function with a slight difference. If the cursor is on the top line and screen roll is enabled, the screen will scroll down one line and the cursor position will be on the new cleared top line. If the cursor is on the top line and screen roll is disabled, the cursor will remain in the same position and there will be no scrolling.

11) SEND ID

This function will send a terminal ID or answerback string which has been defined by function 37.

12) READ SCREEN

This function will transmit the character which appears on the screen at the current cursor position.

13) SEND CURSOR POSITION

This function will transmit the current position of the cursor. A lead-in (defined by function 34) will be sent first and the format of the position coordinates are defined by functions 35 and 36.

14) NEWLINE

The newline function will move the cursor to the first column of the
next lower line. If the cursor is on the bottom line and screen roll
is enabled, the screen will scroll up one line, and the cursor will
move to the first column of the new cleared bottom line. If the cursor is on the bottom line and screen roll is disabled, the cursor will
move to the first column of the top line.

15) CR

The CR (carriage return) function will move the cursor to the first
column of the present line. This is usually assigned the control code
$0D.

16) LF

The LF (line feed) function will move the cursor down one line. The
cursor will remain in the same column. If the cursor is on the bottom line and screen roll is enabled, the screen will scroll up one line,
and the cursor will be on the new cleared bottom line. If the cursor
is on the bottom line and screen roll is disabled, the cursor will move
to the same column of the top line. This function is usually assigned
the control code $0A.

17) ROLL ENABLE

This function enables the scrolling of the screen. When screen roll
is enabled, the screen will scroll when a LF, newline, reverse LF, or
cursor-forward command tends to move the cursor outside of the
current screen.

18) ROLL DISABLE

This function disables the scrolling of the screen. When screen roll
is disabled, the screen will never scroll up or down. Refer to the
individual cursor position function descriptions to determine the
cursor limits when roll is disabled.

19) HILIGHT

If your video card allows hilight (bright) characters, this function
will enable hilighting of all subsequent received characters.

20) LOLIGHT

If your video card allows lolight (dim) characters, this function
will enable lolighting of all subsequent received characters.

21) INVERSE

If your video card allows inverse characters, this function will
enable the inverse display of all subsequent received characters.

22) NORMAL

If your video card allows normal characters, this function will
enable the normal display of all subsequent received characters.

23) BELL

This function will beep your speaker. It is usually assigned the
control code $07.

24) GOTOXY

This function will direct your cursor to a specified row and column
on your video display. The format of the command codes are de-
scribed in functions 25 and 26.

The following video functions are user-defined values or settings
and are not affected by any received control codes, unless otherwise
stated. Once set, the values assigned to these functions remain un-
changed.

25) GOTOXY OFFSET

This value is the numerical offset between the GOTOXY row and
column coordinates and the actual coordinates. This numerical

value is subtracted from the row and column coordinates received to determine the actual row and column where the cursor will be placed. For example, if the offset is hexadecimal $20 and the row coordinate is $20 and the column coordinate is $21, the cursor will be placed in row 0, column 1. The offset can be set anywhere from $00 to $FF hexadecimal.

26) GOTOXY ORDER

This function defines whether the GOTOXY row coordinate appears before the column coordinate, or vice versa. If the terminal being emulated expects to receive the column coordinate before the row coordinate, use XY as the GOTOXY order. If the row coordinate is sent before the column coordinate, use YX.

27) LEAD-IN CHARACTER

This defines the lead-in character. If the terminal being emulated uses a lead-in character for some of the control code sequences, the ascii hexadecimal value of that lead-in character should be entered here. The value can be in the range of $00 through $1F.

28) TAB SPACING

This function defines the spacing between tabs. A hexadecimal value of $00 through $FF can be entered. For example, if $08 is entered, the tabs will be set at every eight columns.

29) VERTICAL WRAP

This function enables or disables the screen vertical wrap-around. When vertical wrap is on, the cursor will wrap around between the top and bottom lines whenever a cursor-down or cursor-up command tends to move the cursor off-screen. When vertical wrap is off, the cursor will never be wrapped on a cursor-down or cursor-up command.

30) HORIZONTAL WRAP

This function will enable or disable line wrap-around caused by a

cursor move. When horizontal wrap is on, the cursor will wrap
around to the next line whenever a cursor-forward or cursor-left
command tends to move the cursor past the left or right margin.
When horizontal wrap is off, the cursor will never wrap around
to the next line on a cursor-forward or cursor-left command.

31) DISPLAY WRAP

This function enables or disables display wrap-around caused by
display of a long line. When display wrap is on, any long line of
characters which would normally extend beyond the right margin
will be wrapped around to the next lower line so all characters
are displayed. When display wrap is off, any characters on a long
line which extend beyond the right margin will not be displayed.

32) SCROLL

This function enables or disables the display scrolling. If scroll is
on, the display will scroll up or down in response to the video func-
tions previously described. If scroll is off, the screen will not scroll.
This function can be changed if the control code assigned to roll
enable or roll disable is received.

33) EMULATION NAME

This defines an abbreviated name for the emulation file. You may
enter up to four characters to identify the emulation. The default
is "No".

34) SEND CURSOR LEAD-IN

This function defines the lead-in character to be sent before the
cursor coordinates are transmitted. The ascii hexadecimal value
must be in the range of $00 to $1F.

35) SEND CURSOR OFFSET

This value is the numerical offset between the transmitted cursor
row and column coordinates and the actual coordinates. This
numerical value is added to the cursor and row column coordi-

nates before they are sent. The offset can be set anywhere from $00 to $FF hexadecimal.

36) SEND CURSOR ORDER

This function defines whether the cursor row coordinate is sent before the column coordinate, or vice versa. If the terminal being emulated sends the column coordinate before the row coordinate, use XY as the order. If the row coordinate is sent before the column coordinate, use YX.

37) ID (ANSWERBACK)

This defines the character string to be transmitted when a terminal ID or answerback is requested. The string can contain displayable and control characters and must be 16 characters or less. You may enter the string as characters or in hexadecimal values.

If you select character entry, enter the string directly from the keyboard. You may enter upper or lower case characters, punctuation symbols, or control characters. You cannot enter control-H because that character is used to backspace in case you have to correct a mistake.

If you select hexadecimal entry, enter the hexadecimal ascii number for each character in the string starting from the beginning. When you are finished, enter 0. If you make a mistake, you must start all over again.

KEYBOARD EMULATION

You can prepare a function key file to emulate the functions of a terminal which is equipped with special function keys. This function key file will let your keyboard generate some of these functions. You should load this function key file as well as the emulation file. Since only nine function keys are provided by this program, you will have to determine which functions you need and assign them to the function keys.

Creation of the function key file is described in Chapter 8. A short example of defining a function key for terminal emulation follows.

Suppose the F1 function key on the terminal generates the following
sequence: $1E $71. $1E is the ascii value for the control-^ character
and $71 is the ascii value for the letter "q". If you want to use your
1 key to emulate the terminal F1 key, enter the following in your
function key file:

1=S"^^q"

The ^^ is the control-^ character and is entered by pressing the
control key, shift key, and ^ key simultaneously.

This function key definition is entered into your function key
file by using the following nine key strokes in the editor:

1) 1
2) =
3) S
4) "
5) [CTRL] P
6) [CTRL] [SHIFT] ^
7) q
8) "
9) [RETURN]

APPENDIX A

ASCII CHARACTERS

Decimal	Hexadecimal	Character	Name
0	00	^@	NUL
1	01	^A	SOH
2	02	^B	STX
3	03	^C	ETX
4	04	^D	EOT
5	05	^E	ENQ
6	06	^F	ACK
7	07	^G	BEL
8	08	^H	BS
9	09	^I	HT
10	0A	^J	LF
11	0B	^K	VT
12	0C	^L	FF
13	0D	^M	CR
14	0E	^N	SO
15	0F	^O	SI
16	10	^P	DLE
17	11	^Q	DC1
18	12	^R	DC2
19	13	^S	DC3
20	14	^T	DC4
21	15	^U	NAK
22	16	^V	SYN
23	17	^W	ETB
24	18	^X	CAN
25	19	^Y	EM
26	1A	^Z	SUB
27	1B	^[	ESC
28	1C	^\	FS
29	1D	^]	GS
30	1E	^^	RS
31	1F	^_	US
32	20		space
33	21	!	exclamation point

34	22	"	quotation mark
35	23	#	pound
36	24	$	dollar
37	25	%	percent
38	26	&	ampersand
39	27	'	apostrophe
40	28	(	open parenthesis
41	29	)	closed parenthesis
42	2A	*	asterisk
43	2B	+	plus
44	2C	,	comma
45	2D	-	hyphen, minus
46	2E	.	period
47	2F	/	slash, virgule
48	30	0	
49	31	1	
50	32	2	
51	33	3	
52	34	4	
53	35	5	
54	36	6	
55	37	7	
56	38	8	
57	39	9	
58	3A	:	colon
59	3B	;	semi-colon
60	3C	<	less than
61	3D	=	equal
62	3E	>	greater than
63	3F	?	question mark
64	40	@	"at"
65	41	A	
66	42	B	
67	43	C	
68	44	D	
69	45	E	
70	46	F	
71	47	G	
72	48	H	
73	49	I	
74	4A	J	

75	4B	K	
76	4C	L	
77	4D	M	
78	4E	N	
79	4F	O	
80	50	P	
81	51	Q	
82	52	R	
83	53	S	
84	54	T	
85	55	U	
86	56	V	
87	57	W	
88	58	X	
89	59	Y	
90	5A	Z	
91	5B	[	open bracket
92	5C	\	backslash
93	5D	]	close bracket
94	5E	^	circumflex
95	5F	_	underscore
96	60	`	grave accent
97	61	a	
98	62	b	
99	63	c	
100	64	d	
101	65	e	
102	66	f	
103	67	g	
104	68	h	
105	69	i	
106	6A	j	
107	6B	k	
108	6C	l	
109	6D	m	
110	6E	n	
111	6F	o	
112	70	p	
113	71	q	
114	72	r	
115	73	s	

Appendix A. ASCII Characters

116	74	t	
117	75	u	
118	76	v	
119	77	w	
120	78	x	
121	79	y	
122	7A	z	
123	7B	{	open brace
124	7C	|	line
125	7D	}	close brace
126	7E	~	tilde
127	7F		DEL

APPENDIX B

COMMAND/CONTROL WORDS

6551 CONTROL WORD FORMAT

d7	d6, d5	d4	d3, d2, d1, d0
0=1 bit	00=8 bits	0=ext clock	0000=16X ext clock
1=2 bits*	01=7 bits	1=baud rate	0001=50 baud
	10=6 bits		0010=75 baud
	11=5 bits		0011=110 baud
			0100=135 baud
			0101=150 baud
			0110=300 baud
			0111=600 baud
*=1-1/2 bits for 5 bits, no parity			1000=1200 baud
=1 bit for 8 bits, parity			1001=1800 baud
			1010=2400 baud
			1011=3600 baud
			1100=4800 baud
			1101=7200 baud
			1110=9600 baud
			1111=19200 baud

6551 COMMAND WORD FORMAT

d7, d6	d5	d4	d3, d2	d1	d0
00=odd	0=no par	0=norm	00=RTS hi,Tx int off	Interrupt	DTR
01=even	1=par	1=echo	01=RTS lo,Tx int on	0=on	0=hi
10=mark			10=RTS lo,Tx int off	1=off	1=lo
11=space			11=RTS lo,Tx int off, break		

2651 MODE REGISTER 1 FORMAT

d7, d6	d5	d4	d3, d2	d1, d0
00=invalid	0=odd	0=no par	00=5 bits	00=sync
01=1 bit	1=even	1=par	01=6 bits	01=X1
10=1-1/2 bits			10=7 bits	10=X16
11=2 bits			11=8 bits	11=X64

2651 MODE REGISTER 2 FORMAT

d7, d6	d5	d4	d3, d2, d1, d0
not used	Tx clock 0=ext 1=int	Rx clock 0=ext 1=int	0000=50 baud
			0001=75 baud
			0010=110 baud
			0011=135 baud
			0100=150 baud
			0101=300 baud
			0110=600 baud
			0111=1200 baud
			1000=1800 baud
			1001=2000 baud
			1010=2400 baud
			1011=3600 baud
			1100=4800 baud
			1101=7200 baud
			1110=9600 baud
			1111=19200 baud

6850 COMMAND WORD FORMAT

d7	d6, d5	d4, d3, d2	d1, d0
0=int disabled	00=RTS lo,Tx int off	000=7+2+even	00=X1
1=int enabled	01=RTS lo,Tx int on	001=7+2+odd	01=X16
	10=RTS hi,Tx int off	010=7+1+even	10=X64
	11=RTS lo,break	011=7+1+odd	11=reset
		100=8+2+none	
		101=8+1+none	
		110=8+1+even	
		111=8+1+odd	

8251 MODE INSTRUCTION WORD FORMAT

d7, d6	d5	d4	d3, d2	d1, d0
00=invalid	0=odd	0=no par	00=5 bits	00=sync
01=1 bit	1=even	1=par	01=6 bits	01=X1
10=1-1/2 bits			10=7 bits	10=X16
11=2 bits			11=8 bits	11=X64

APPENDIX C

PROGRAMS SUPPLIED

Programs marked * are described in Apple documentation available elsewhere.

DOS 3.3 WORK DISK

HELLO	Starts MODEM MGR after disk boot
MDM1	MODEM MGR program module
MDM2	MODEM MGR program module
MDM3	MODEM MGR program module
MDM4	MODEM MGR program module
MDM0	Installed MODEM MGR program module
HELP	Main help file
MACRO.H	Help with macro commands
EDITOR.H	Help with editing
DISK.H	Help with disk operations
CAPTURE.H	Help with capture buffer
DIAL.H	Help with dialing
CLOCK.H	Help with clock features
EMULATION.H	Help with emulation
FILENAME.H	Help with filenames
PRINTER.H	Help with printing
TUTOR	Editor tutorial
PHONE.LIST	Sample phone list
COMPUSERVE	Sample CompuServe log-in macro
SOURCE	Sample SOURCE log-in macro

DOS 3.3 INSTALL DISK

HELLO	Starts INSTALL after disk boot
INSTALL	Installation program
DMD--	Install modules

Appendix C. Programs Supplied

DOS 3.3 UTILITY DISK

HELLO	
MAKE.EMULATION	Runs emulation program
MAKEMU	Emulation program module
COPYA	DOS 3.3 disk copy program*
FID	DOS 3.3 file copy program*
COPY.OBJ0	COPYA program module
SROC.EMU	Sample Soroc emulation file
DM3A.EMU	Sample ADM3-A emulation file
IBM.EMU	Sample IBM 3101 emulation file
TLVD.EMU	Sample Televideo emulation file
VT52.EMU	Sample DEC VT-52 emulation file
D200.EMU	Sample DG D200 emulation file
ADDS.EMU	Sample ADDS emulation file

PRODOS WORK DISK

PRODOS	ProDOS operating system*
MMGR.SYSTEM	Starts MODEM MGR after disk boot
MDP1	MODEM MGR program module
MDP2	MODEM MGR program module
MDP3	MODEM MGR program module
MDP4	MODEM MGR program module
MDP0	Installed MODEM MGR program module
HELP	Main help file
CAPTURE.H	Help with capture buffer
CLOCK.H	Help with clock features
DIAL.H	Help with dialing
DISK.H	Help with disk operations
EDITOR.H	Help with editing
EMULATION.H	Help with emulation
MACRO.H	Help with macros commands
PATHNAME.H	Help with pathnames
PRINTER.H	Help with printing
TUTOR	Editor tutorial
PHONE.LIST	Sample phone list
COMPUSERVE	Sample CompuServe log-in macro
SOURCE	Sample SOURCE log-in macro

Appendix C. Programs Supplied

PRODOS INSTALL DISK

PRODOS	ProDOS operating system*
BASIC.SYSTEM	BASIC ProDOS system*
STARTUP	Starts INSTALL after disk boot
PINSTALL	Installation program
PMDxx	Install modules
Zx	Install module sub-directories

PRODOS UTILITY DISK

PRODOS	ProDOS operating system*
BASIC.SYSTEM	BASIC ProDOS system*
MAKE.EMULATION	Runs emulation program
PMAKEMU	Emulation program module
Z9	Serial printer install sub-directory
FILER	ProDOS disk/file utility program*
CONVERT	ProDOS/DOS 3.3 file converter*
FLUSH	Remove or add CR or LF in text files#
FLUSH.OBJ	FLUSH program module
SROC.EMU	Sample Soroc emulation file
DM3A.EMU	Sample ADM3-A emulation file
IBM.EMU	Sample IBM 3101 emulation file
TLVD.EMU	Sample Televideo emulation file
D200.EMU	Sample DG D200 emulation file
VT52.EMU	Sample DEC VT-52 emulation file
ADDS.EMU	Sample ADDS emulation file

#Use at your own risk. The FLUSH program is limited to small
ProDOS text files and has not been user-tested.

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Apple Parallel Printer Interface card   1-6, 5-10

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